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# ANCIENT EGYPT AND THE EAST

C.H.C.

1935.

JUNE.

B.H.C. PART I.



## CONTENTS.

1. COPTIC PAINTED POTTERY.  
DR. M. A. MURRAY.
2. RECENT DISCOVERIES IN SYRIA  
AND SINAI. FLINDERS PETRIE.
3. NOTES ON GLAZED STONES.—*cont.*  
PART II.—GLAZED QUARTZ.  
PART III.—CARNELIAN, AGATE  
AND FELSPAR. H. C. BECK.
4. GEOMETRICAL ORNAMENT ON  
ARCHAIC EGYPTIAN POTTERY.  
PROF. V. I. AVDIEF.
5. A PANTHEISTIC REPRESENTATION  
OF AMON. A. PIANKOFF.
6. CHANGES IN THE EGYPTIAN  
COAST. FLINDERS PETRIE.
7. THE PULL-SAW IN EGYPT.  
MISS M. LANE.
8. NOTE ON INSCRIBED AMULETS.  
FLINDERS PETRIE.
9. REVIEWS.
10. JOURNALS. } (SEE INSIDE COVER.)
11. NOTES AND NEWS.
12. OBITUARY NOTICES.

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# ANCIENT EGYPT AND THE EAST

1935.

NUMBER.

PART II.

## CONTENTS



(Page 81)

1. JEWELLERY AND BEADS FROM NEAR NEHAVAND.  
D. B. HARDEN.
2. THE BARNDOR FOWL IN EGYPTIAN ART.  
G. D. HORNBLOWER.
3. THE STATISTICAL TREATMENT OF ANCIENT  
WEIGHTS. A. S. HEMMY.
4. ARCHAEOLOGICAL EXPEDITIONS TO THE NEAR  
EAST AND ASIA.
5. THE FUTURE OF ARCHAEOLOGY.  
FLINDERS PETRIE.
6. SYRO-CAPPADOCIAN STAMP SEALS AT  
LENINGRAD. A. PROCOPE-WALTER.
7. TEMPLE AT 'AIN AMUR IN THE LIBYAN DESERT  
MISS E. W. GARDNER.
8. REVIEWS } (SEE INSIDE COVER.)
9. JOURNALS }
10. NOTES AND NEWS.
11. OBITUARY NOTICES.
12. INDEX.

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„ „ „ X, 3. 1935.

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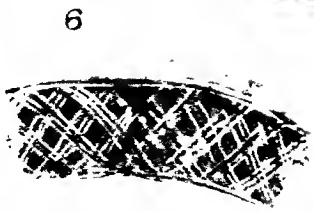
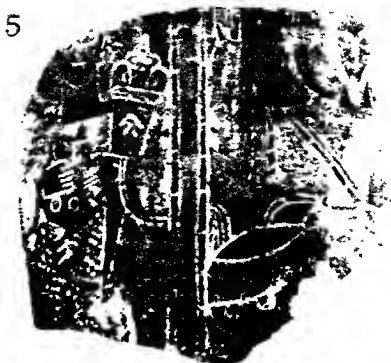
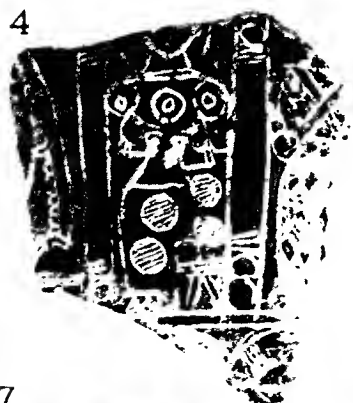


PLATE I.  
COPTIC PAINTED POTTERY.

## ANCIENT EGYPT AND THE EAST.

*The Editors regret that the publication of ANCIENT EGYPT AND THE EAST will cease with the current number, in which is included the index which completes Volume R-U, 1932-5.*

*It is hoped that subscribers will continue to support the British School of Archaeology in Egypt, whose activities in the field will be carried on as before under the direction of Professor Sir Flinders Petrie.*

*The headquarters of the School remain at University College, London, W.C.1.*



# ANCIENT EGYPT AND THE EAST

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## COPTIC PAINTED POTTERY.

[*Note.*—In the line drawings red is indicated by heraldic shading |||||.]

LITTLE has hitherto been written on Coptic painted pottery; in fact, except for the language, the textiles, and a little of the church architecture, the Coptic period is archaeologically almost an untouched field. A careful study of Coptic art in its various phases might very well throw light both on the influences which brought it into being and the effect it had on contemporary art elsewhere. The influence of Egypt on the early Christian Church in the East was very great; and though that influence was lessened by the internecine strife between the Melkite and Jacobean factions, the individuality of Coptic art was never lost. It has continued to the present day, and must have affected the art of the Mahomedan period either directly or indirectly. These are points which no archaeologist has yet tackled. Nothing, moreover, is known of the social conditions and social history except from the scanty literary remains, and these refer chiefly to religious matters and religious houses. The exact dating of Coptic pottery is still unknown; excavators usually disregard Coptic pottery, and, if they preserve it, the associated objects are not recorded; museum authorities refuse to accept it or relegate it to store-rooms. In short, the Coptic period is the Cinderella of Egyptological studies.

In the few examples published here (all from the Petrie Collection at University College) two classes can be distinguished, the ecclesiastical and the secular.

In pls. I, 1-6, 9; IX, 1-5, are fragments of three large vessels of the same type though of different dates; the form of one of the vessels is shown in pl. X, 6. The ware is coarse and heavy, the surface is red with a narrow black core, and the walls of the vase are 7 mm. thick. In all three examples there is a wash of white over the whole surface of the vessel and the design has been worked out in black outline, the colour having now faded to a dark brown.

The earliest of the three (pls. I, 5 ; IX, 1) is a large fragment on which two figures remain. The field of the vase was originally divided into panels, as in the case of the more complete vessel, each panel containing a single figure. On the left is a youthful ecclesiastic, fully and richly robed ; in the crook of his left arm he holds what appears to be a gigantic dagger, perhaps the instrument of his martyrdom. On the right a bearded figure rides on a horse, of which only the hindquarters remain. This is probably a military saint, for he wears a costume which is not sacerdotal. The firmness and delicacy of line should be compared with the much cruder work of the second vase. The method of representing the eyes also differs from the second vase, and the hands are recognisable as parts of a human being.

(Pls. I, 1-4, 6 ; IX, 3-5). This is a remarkable vessel on account of the mixture of painting and modelling as seen in the woman's face, where the nose appears to form a kind of lug handle, which is seen in the outline of the vessel (pl. X, 6). There was certainly a similar face on the opposite side of the vase, for a ringlet, one earring and a few of the forehead curls still remain. The panel decoration is like that of the vase described above, but the dividing lines lack the simplicity of that example. Below the panels is an arched border, each arch filled by a bird or a fish. The figures in the panels are of male saints. They are clothed in elaborate ecclesiastical garments, and are represented as seated on stools, the legs being in profile while the faces and upper parts of the bodies are turned to the spectator. The beardless figure playing on a long flute may perhaps be recognisable when the iconography of the period is studied. The painting of the eyes of the woman's face is entirely un-Egyptian ; the two concentric rings with central dot is a method of representing the eye not known in pre-Christian Egypt and is probably an introduction from elsewhere. The long horizontal line from the eye to the temple is, however, reminiscent of pharaonic art. The hair also, both the fringe and the ringlets, are not painted in the ancient manner. The decorated rim of the vase (pl. I, 6) shows a basket-work design. From the style of painting and design, this vase is later in date than the one described above.

Pl. I, 9 (see also pl. IX, 2) belongs probably to a similar type of vase, but the technique and style of the painting indicate a different provenance and perhaps a different date. The ware is 14 mm. thick and coarser than the other two examples ; it has a thick black core. The whole surface was covered with a wash of white now turned by age to a pale drab ; the outlines are in blue-black and are thick and coarse, without any of the delicacy of no. 5 in pl. I. The background was painted in bright red, the figures being left in the pale drab of the surface colour.

Faces in relief on vases have never been common in ancient Egypt, but they are not rare on Coptic pottery. The example in pl. II, 2, is fairly early ; it is part of the rim of a vase of red pottery which was covered with a wash of white. The nose, eyes and hair are raised above the surface of the vase ; the eyes are indicated by concentric circles, as in pl. I, 3 ; the curls of the hair are shown as incised circles. The fragmentary condition of the face makes it impossible to determine whether the lower ringlets represent hair on a female head or whiskers on a male face.

The two-handled vase (pl. VII, 2) has a crude representation of a human face in relief immediately under the rim. The eyes are represented by raised rings as in the example in pl. II, 2. There is a depression in the centre of each

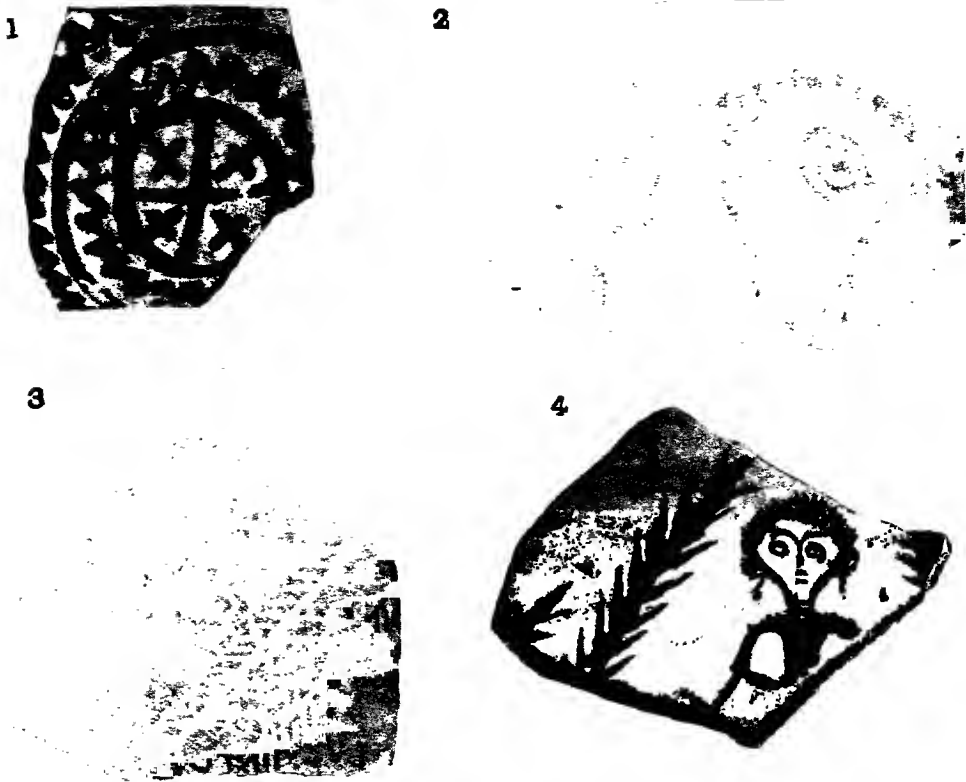


PLATE II.

eye, surrounded with a circle of black. Though the vase is of the same ware as those in the same plate, it is probably of rather earlier date, as is suggested by the form of the vessel with overhanging rim and handles attached to the neck.

A small part of a very large vase (pl. III) shows an unusually rich decoration. The diameter of the rim is about 50 cm.; the ware is coarse, 20 mm. in thickness, with a thick black core. The body of the vase is slightly polished, but the neck has a matt surface. The peculiarity of the decoration is the row of heads in relief round the neck; the height of the largest of these heads is 13 cm. Though the faces have been entirely destroyed there are indications that they were painted white and there are traces of black on the hair, but the coronet round the head is uncoloured. On the body of the vase the design is of panels of irregular sizes, each filled with a single spiral. Above these are arches, the upper band of which is red, the lines being in black. At the junction of the arches is a tall cross.

The base of a fruit-bowl (pl. X, 5) is decorated on the stem with lines of black and red. The ware is fairly fine and is sufficiently well baked to be red throughout; the thickness is 4 mm. The surface is covered with a pinkish wash. At the middle of the bowl (pl. IX, 6) is a painting of a woman's face in outline, with the eyes and hair in solid colour. The type of face is not Egyptian, the eyes are unusually large, the hair is clearly short; round the neck is a close necklet, and the material of the dress is indicated by wavy lines suggesting soft folds. There have been other details on each side of the head, but the outer part of

*Coptic Painted Pottery.*

the bowl is broken away completely and nothing now remains but an indeterminate blotch.

Another figure of a woman is also from a bowl (pl. II, 4). Though only the upper part remains, the position of the figure on the bowl shows that it was standing. On each side are palm-branches which seem to represent a bower in which the woman stood; they are not the palms of martyrdom as there is no halo round the head. The technique of this crude painting is entirely different from the head in pl. IX, 6; the paint is laid directly on the pottery and not on a wash of another material, the eyes are in outline, the hair is represented by strokes of the brush and not painted solid, but the body is in solid black with no representation of a garment. The style of representing the hair and eyes differs also from the woman's face on the large vase (pl. I, 3).

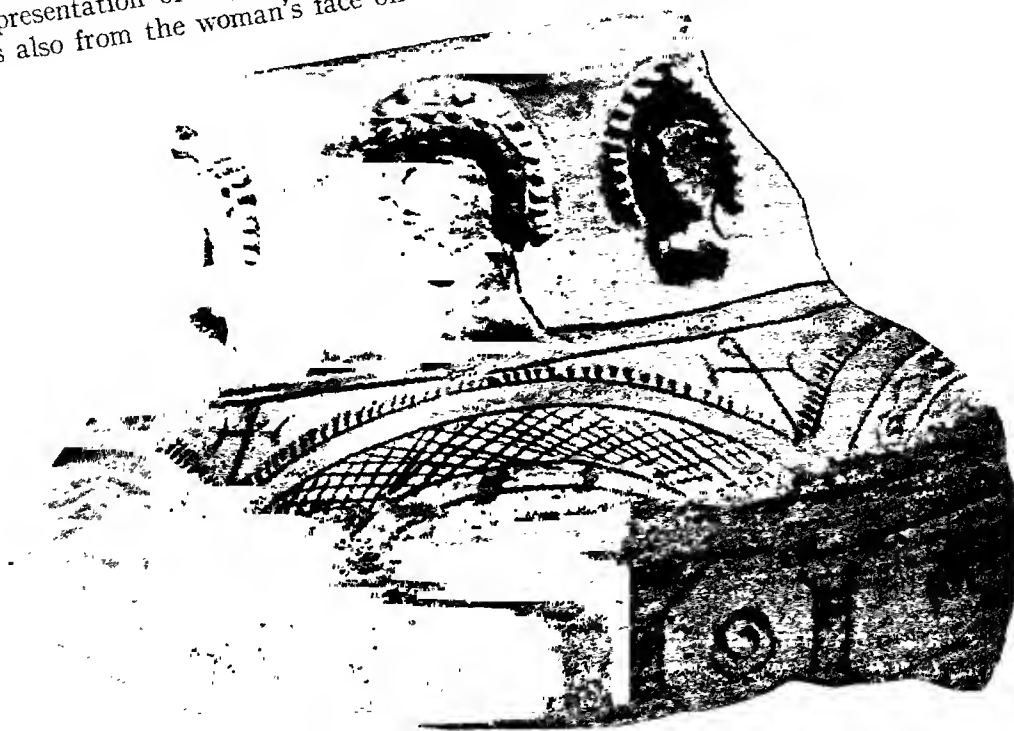


PLATE III.

In all these pieces where a human being is represented the face is turned to the spectator. This fact alone shows that Coptic art is not the descendant of the art of ancient Egypt, but derives from some foreign source, probably Greek or Roman. It is usually said to owe its origin to Byzantium, but there is evidence to show that the front-view face can be found in Egypt before that period, even on painted pottery, *e.g.*, pl. IX, 6. Another influence should also be taken into account, and that is Persia, though it is the Persia of Chosroes, not of Darius.

In the fragments of two little bowls (pl. I, 7, 8) the ware is very finely levigated and is pale pink in colour. The thinness of the walls of the bowls is remarkable, being a little over 1 mm. thick. The figures are painted directly on the pottery in dark purple, probably manganese; the belts and necklaces are white, the long streaks and cloudy washes are in bright red. The style carries on the canons of art of pharaonic Egypt—profile face and legs with front-view

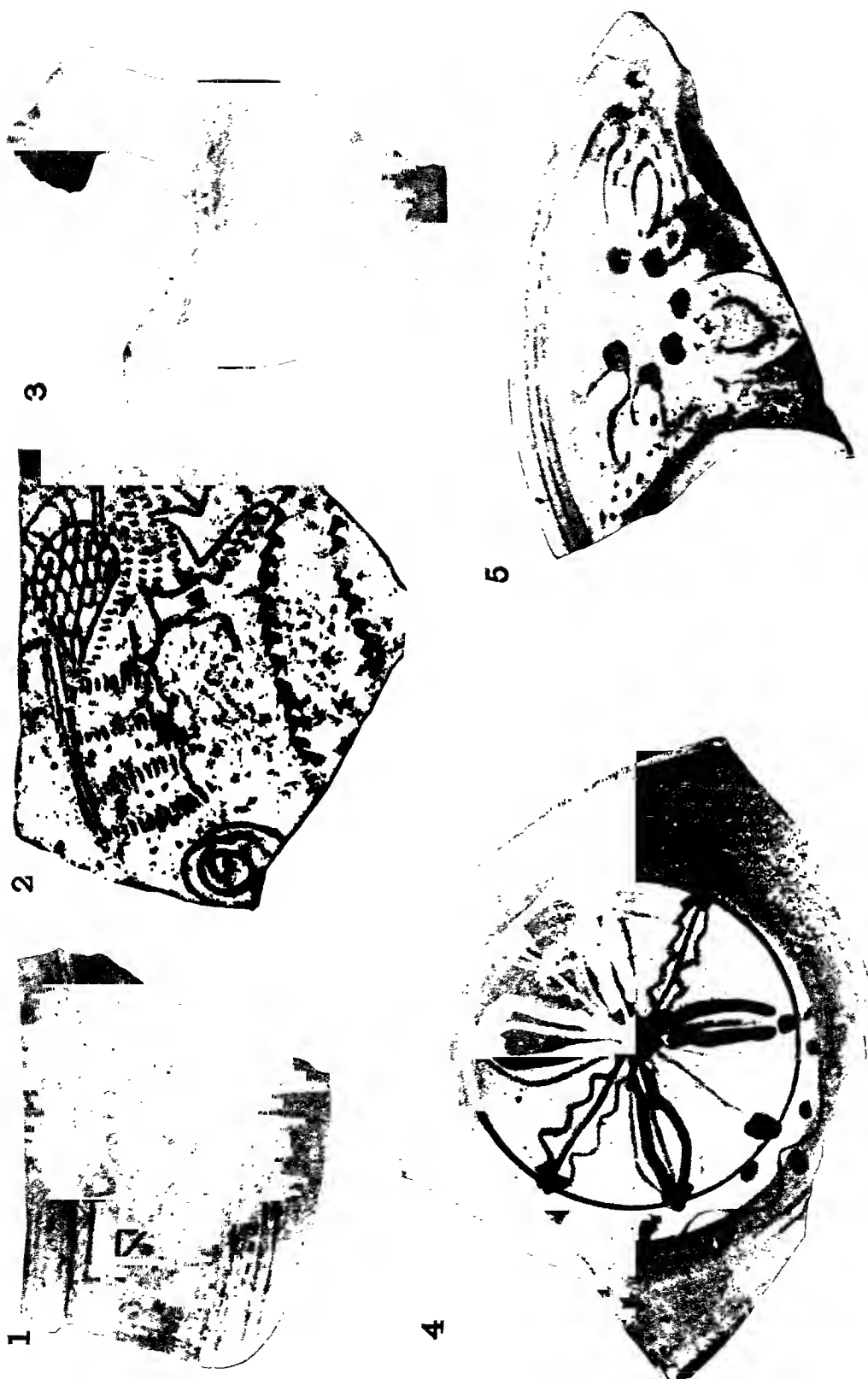


PLATE IV.





body—but the fat rounded limbs, large heads and long chins are un-Egyptian. Both pottery and figures suggest a foreign origin.

Figure-vases are rare in historic Egypt and are often foreign when they occur; in Coptic times they are equally rare. The example shown in pl. IV, 3, is one of the few known. It is of a dark reddish-buff ware with decorations in dark brown (perhaps manganese). It appears to represent a cock, but the beak is unfortunately broken.

Though figure vases are uncommon, animal and bird *motifs* are not infrequent. The running animal occurs twice among these fragments. One vase (pl. V, 2) is 6 mm. thick, the ware is fine and well fired and is pale red in colour. The whole surface has been washed with white, now a pale drab. The design is in panels, in one of which is a running antelope painted in solid black. The decorative lines and the network are also in black, and above the network is a band of red. The other running animal is shown on pl. VIII, 4; it also appears to be an antelope.

The fragment (pl. V, 3) is from the upper part of a vase of coarse red ware with a black core, 8 mm. thick. The surface is covered with a wash of white, which was laid on thickly over a larger space than is covered by the design so that it forms a kind of border to the bird. The design may have been in panels, of which only one vertical line remains. The outlines are in black, the comb and wattles of the bird are red, and there is a patch of red on the wing; the tail feathers are alternately red and green, and there is a small patch of green on the indeterminate object on the left.

Another bird decoration is seen in pl. IX, 7. This fragment is part of the shoulder and neck of a vase. The ware is red, 7 mm. thick. The ground is covered with a wash of white, the decoration being in dark purple. Both design and painting are extremely crude.

A fragment of coarse red ware (pl. IV, 2) is covered with a bright yellow wash. The decoration consists of a large bird, of which the head is unfortunately lost. The outlines are in black. The feathering of the bird's wing is indicated by a series of ovals, and the plumage of the breast and tail by rows of short lines. Below the feet of the bird are two lines of roughly made zigzags, and near the tail is a crooked spiral.

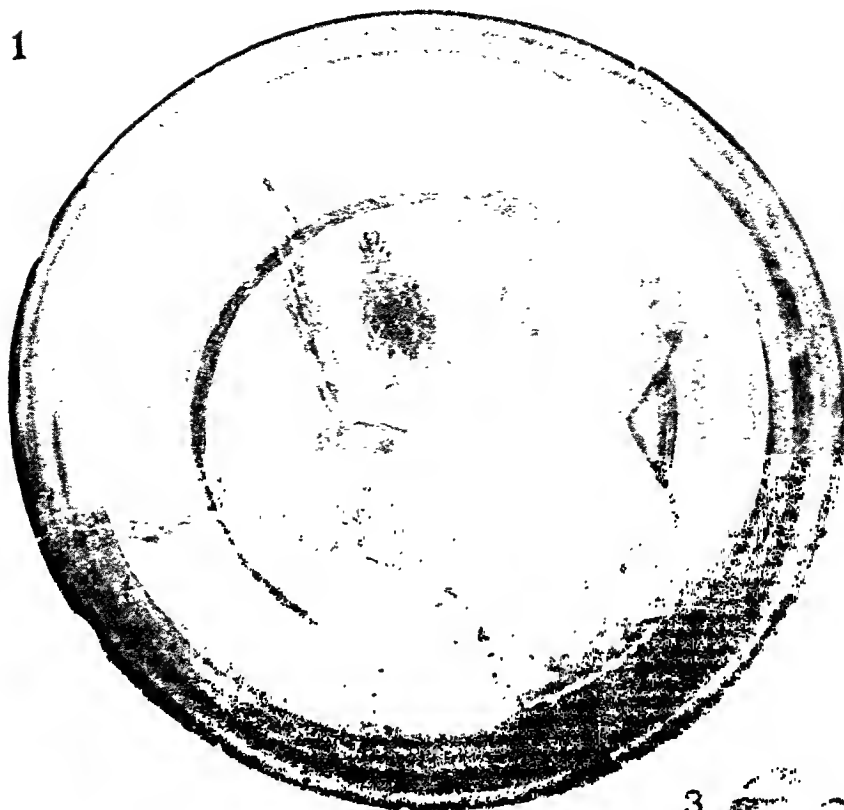
The cylindrical vase (pls. VI, 3; IX, 8) is of a fine pinkish ware, 3 mm. thick. It was covered with a wash of white, now drab; the decoration is divided into horizontal bands and is carried out in black with a few patches in red.

Pl. V, 4, 5, are parts of a large shallow bowl. The ware is fairly fine, black in colour. The thickness varies slightly, the average being 9 mm. The surface was covered with a red slip and then washed over with a cream-coloured wash. The design was carried out in the peculiar purplish-brown of manganese. Along the rim is a wide band of colour on which large circular spots are painted in white. Within the hollow of the bowl wide bands of colour are displayed festoon-wise all round; and within each loop of the festoon is the figure of some living creature, a bird (no. 4) or a fish (no. 5). The figures are in outline, the details being expressed in lines and dots.

Pl. IX, 9 is a fragment of rough red ware, with black core; the thickness varies from 5 to 8 mm. The surface is covered with a wash of bright yellow. The fish is painted in red with outlines and details in black. Above and below the fish is a band of red.

There are a few floral designs. The plate seen in pls. VI, 1; VIII, 1, has a diameter of 32 cm.; the ware is fine, and colour a pale red. The surface is covered

1



2



3



with a bright red slip. The flower, which somewhat resembles a teasel, is painted white with details in black; the plant is outlined in black and enclosed in a ring of white.

The fragment of an unusually large vessel (pl. V, 1) is of a coarse red ware, 10 mm. thick, with a black core. The design is carried out in brown with irregular spots of red, perhaps representing stalks and flowers.

The base of a large bowl (pl. VIII, 3) has a ring stand 23 cm. in diameter. It is made of a fine reddish ware, the thickness of the bowl being 6 mm. As usual, the surface is covered with a wash of white on which the design is painted. The design, in red, is of fruit or flowers, with outlines and details in dark blue or bluish-black.

The fragment shown in pl. VIII, 8, is of a fine reddish ware fired very hard; thickness 5 mm. This ware is reminiscent of some of the pottery of the late pharaonic period, and the design carries on a *lotus-motif* common in ancient Egypt during the New Kingdom. The surface is washed over with a buff wash as a ground colour; the design is developed in the purplish-brown of manganese with occasional patches of red. The wide bands below the lotus border have a foundation of red under the manganese.

There are several designs which do not come under the heads given above. In pl. IV, nos. 4 and 5 are made of the same kind of ware though they do not belong to the same vessel. The ware is very fine and well fired, and of an even light colour throughout. No. 4 is the centre part of a shallow bowl and is decorated with a circular patch of white, over which a wheel-like object of eight points radiates from a central spot. The spot is black, the thick lines of the "spokes" of the wheel red, the thin lines pale brown; the spots at the tip of the spokes are black. The whole design is enclosed by a fine line of black, then by a wavy line with spots of black. Outside these again are two lines of black, just visible in the photograph.

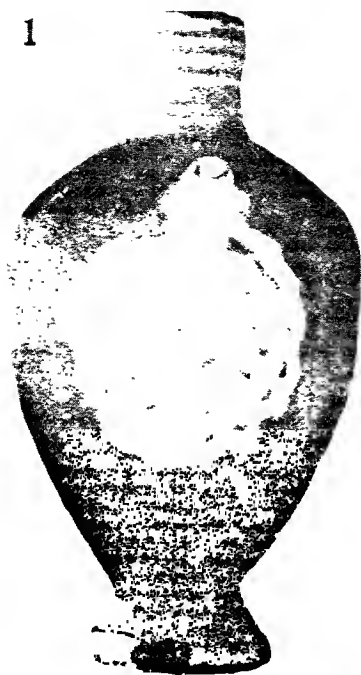
No. 5 is the rim of a shallow bowl or deep platter. The design is painted directly on the pottery, and consists of three horseshoe-shaped objects in white, outlined in black and decorated with small black spots. At the ends of each horseshoe are two large black spots, which together form an incomplete circle. Large black spots are painted at fairly regular intervals along the rim. The drilled hole on the right shows that the vessel was broken and mended anciently.

Pl. V, 6, is a large sherd which has clearly been re-used, as the edges are smoothed and bevelled with much rubbing. The ware is fine, of a dull greyish drab; thickness 10 mm. The geometric design consists of intersecting circles in black, the interspaces being coloured red. The circles have been drawn by hand without any mechanical means, and are irregular in consequence. The fact that the decoration is contained within a rectangle and is not continuous shows that this is an artist's pattern-piece, and was not intended as the decoration of a vase.

Pl. IV, 1, shows a fragment of the rim of a large vessel. The ware is dark red, the decoration black. The design is in panels, each panel containing an equal-armed cross. The arms of the crosses are ornamented with diagonal lines and dots, and in the centre there is a large dot enclosed with a ring of small circles. The jar was certainly for church use, perhaps for storing the sacramental wine which, even at the present day, is often made in the church.

Pl. II, 3, is part of an elaborately decorated vase. The ware is extremely

1



2



3



4



5



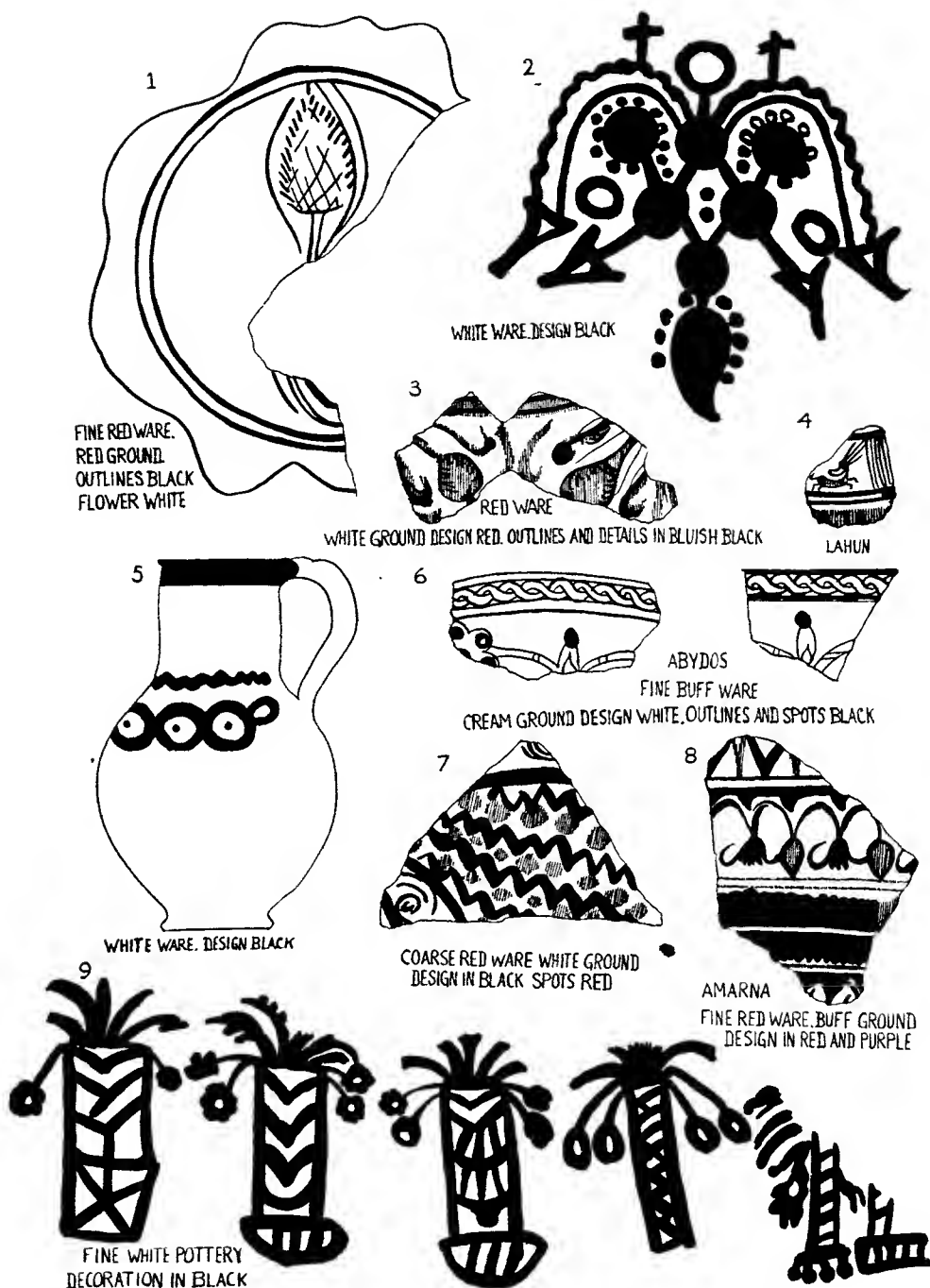
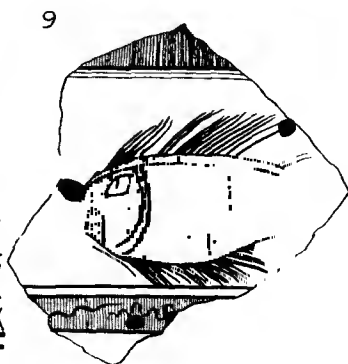
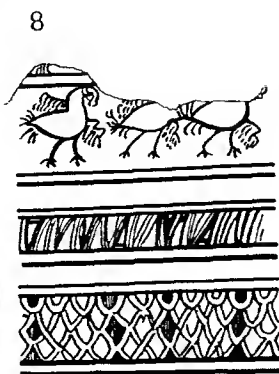
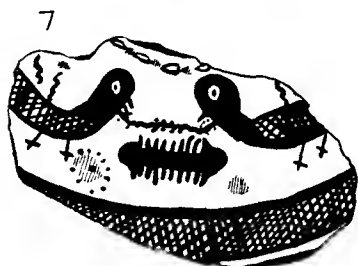
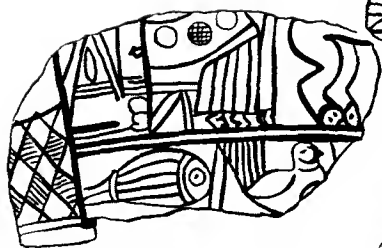
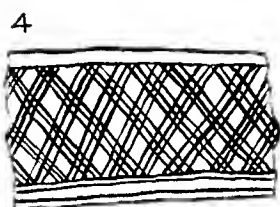
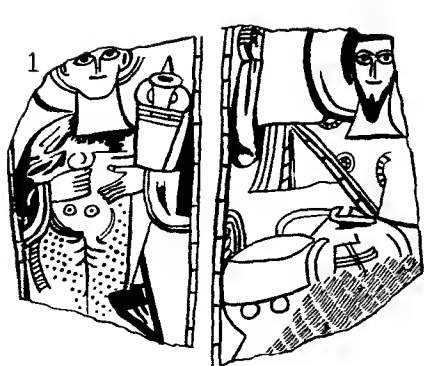


PLATE VIII.

coarse, as can be seen in the photograph; and, as in all such ware, the core is black, only the outer part being fired sufficiently to turn red. The ground is covered with a wash of dark bright red; the wide bands, quatrefoil and wavy line are painted in light yellow; the outlines, guilloche border, and other details are in black.

A sherd from a large vessel is shown in pl. VIII, 7. The ware is excessively coarse, 15 mm. thick, with a black core. The surface is covered with a wash



of white, over which are roughly painted wide zigzag lines in black and irregular spots in red. At the left is a small spiral in black.

A special kind of ware appears to have been used chiefly for ecclesiastical purposes (pl. VII). This is a hard white pottery, wheel-made, the clay finely levigated. The handles and spouts are rather clumsily put on, and the junction of the spout with the body of the vase is masked with a wide line of black. In all examples of this kind of ware the decoration is in black or a very dark brown, probably black originally. The date of these vases is probably mediaeval. All the following examples are made in this ware.

Pl. VII, 1. The base has a line of black; the spout and the circular ornament below it are also black. The neck is ribbed and there is no trace of handles. The circular decoration consists of an outer wavy line which appears to issue from the black circle at the base of the spout; it continues spirally as the inner wavy line. The area enclosed by the two wavy lines is filled with an equal-armed cross surrounded with semi-circles based on the inner wavy line, each semi-circle having a large black dot in the centre. The wavy line probably represents water, especially as it issues from the spout; the connection of water and the cross suggests that the vessel was intended to hold the baptismal waters.

Pl. VII, 2. This vase has been already described on p. 2 among the human representations. It seems to have been for some secular use, but it is of the same ware as the others in the same plate. The painted decoration is in black.

Pl. VII, 3, 4 (see also pl. X, 3). Two views of a one-handled vessel. The design on a similar, but two-handled, vase is shown in pl. VIII, 2. The designs, though obviously intended to be alike, vary somewhat in detail. In both, the connection of the cross with water suggests the use of the vessel for holding the water for baptism. The rest of the decoration appears to be a decadent floral design, though a theological *motif* might be indicated in the pear-shaped object in the lowest part of the design which "proceeds" from the two circular objects above.

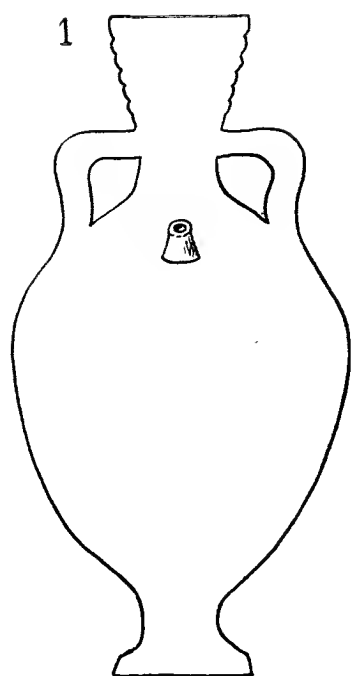
Pl. VII, 5 (see also pl. X, 4). The "handkerchief" form of design is common in Coptic work of the Xth century and later. The design is always square, hence the name which I have applied to it. In this example the central portion consists of a circle in the middle joined crosswise to four circles which form the corners of the square. It is possible that the five circles typify the Five Wounds. The circles in the corners are joined to one another by straight lines, the intervening spaces being filled with loops. The whole is enclosed by two lines which are connected at the corners by small circles. Decorated squares enclosing writings are a common feature of Coptic inscriptions in the temple at Abydos.

A fragment of a similar vessel is shown in pl. II, 1. The decoration is circular. An equal-armed cross forms the centre of a circle, the spaces between the arms being filled with small crosses. The four enclosing lines are alternately plain and wavy.

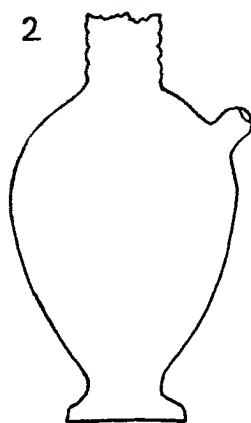
The fragment of a large vessel (pls. VI, 2; VIII, 9) has an unusual design of stylised date-palms. The bunches of fruit are conventionalised into flowers, and the characteristic roughness of the stem is indicated by lines. An interesting point in the representation is that the trees are shown as growing in a circular hollow or cup in the earth as in the hieroglyph of a tree in the pharaonic periods.

The jug (pl. VIII, 5) is the only specimen of its kind. The decoration

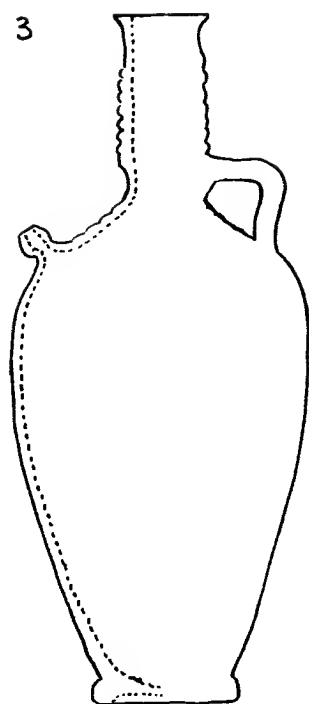




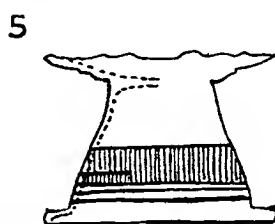
*fine white ware  
spout put on separately*



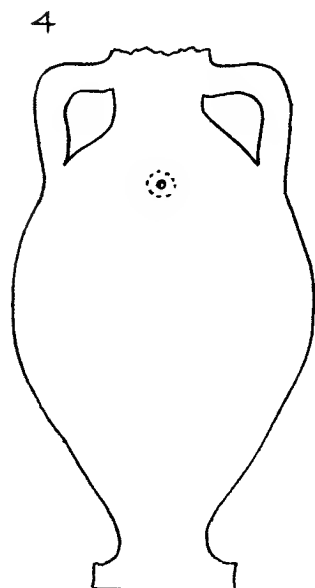
*fine white ware  
decoration in brown*



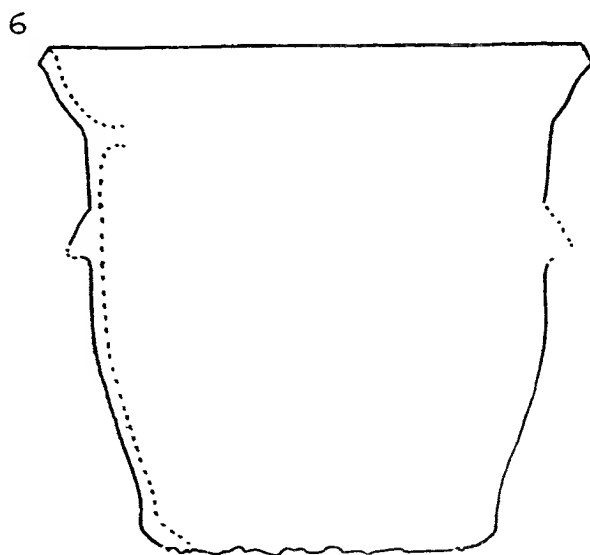
*fine white ware  
painted in black*



*red ware  
decoration in red  
and black*



*fine white ware  
spout put on separately*



*coarse red ware, black core  
design in black on white ground*

consists of the end-piece of a strip of conjoined circles with a dot in the middle of each. Above is a wavy line.

Painted pottery, except for the short period of Tell el Amarna, is so rare in pharaonic Egypt as to be considered worthy of notice when found. Consequently it is allowable to regard such decorated ware as being due to foreign influence or importation during the course of Egyptian history. But painted pottery is not uncommon in Coptic times, as the number and variety of pieces here published must show. So great a change in the decoration of common objects indicates some change in civilization, which in this instance may well have originated elsewhere. The designs also suggest foreign influence. Dots and spots are a noticeable element in Coptic work, but in pharaonic Egypt a spot design is never indigenous, it is always the mark of a foreign origin. The guilloche (pl. II, 3) also is not found in ancient Egypt; purple paint in cross-line patterns (pl. IX, 7) suggests European work; the teasel-like plant (pl. VIII, 1) is not Egyptian. The many foreign elements shown in the paintings on pottery of the Coptic period suggest that this is not an indigenous art, but was brought in from some foreign source. The tracing of its origins might be a fruitful field of study.

M. A. MURRAY.

## RECENT DISCOVERIES IN SYRIA AND SINAI.

### SEASON 1934-35.

THE work of the British School of Egyptian Archaeology at Gaza in the last few years had pointed strongly to North Syria as the source or channel of large painted vases, and gold-work of granulated workmanship. A search over that



FIG. 1.—PEASANTS AT TELL TERMOS, SYRIA.

region was most desirable. In a motor omnibus, bought second-hand in Jerusalem, and furnished with foodstores and blankets, water cans for daily supply, and tents for Mr. J. C. Ellis and our chauffeur, we covered 1,200 miles in Syria during seven weeks, from October to December. We daily searched *tells* near the coast, observing the dates of potsherds. From Tyre up to beyond Antioch the coast region is rich in *tells*, mostly of the Bronze Age. The main group is in the plain of the Eleutheros. This river is the boundary of the Libanese State in which excavation is practically prohibited by Syrian rule; across the river to the north is the Alawit State, where researches are allowed.

In the Eleutheros plain is a population closely approximating to the old Amorite type. The tall head, long face, and aquiline nose are still to be seen, and with great vivacity and bright expression. Here was the stock which charmed the Egyptians, and which so greatly modified the Egyptian type during the XVIIIth dynasty. In the hills north of the plain, an admixture of types is seen (fig. 1). An ethnographical survey is greatly needed to trace the present boundaries of the many varieties of facial type and dress in Syria.

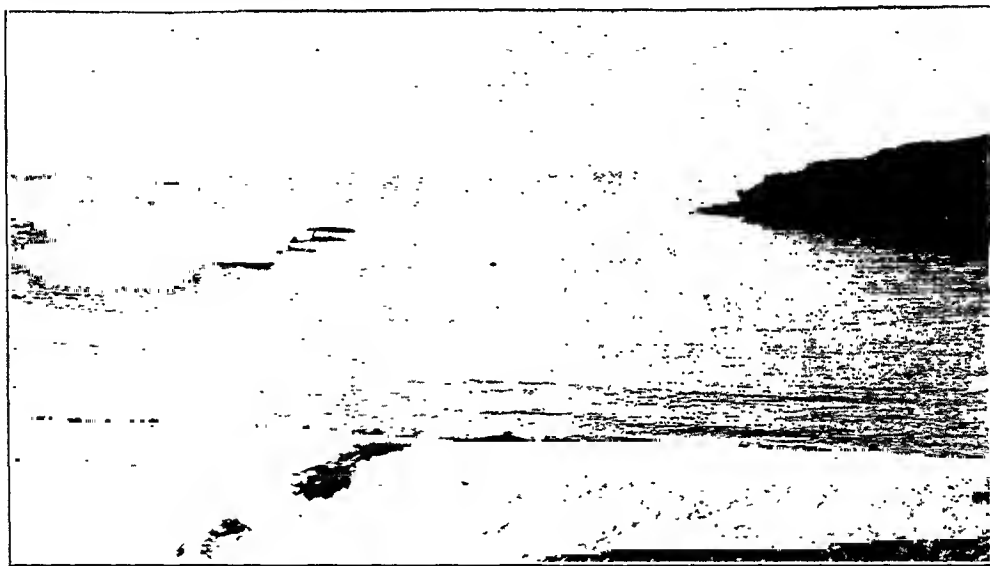


FIG. 2.—MOUTH OF HARBOUR AT JUBAYL (GUBLA).

The best-known place mentioned in the Tell el-Amarna letters is Gubla, the last refuge of Ribaddi, the Egyptian viceroy. It is still called Jebayl. Though there is a considerable town, happily none of it encroaches on the little port which remains as it was known of old (fig. 2). It is a semi-circular basin, about 250 ft. wide, with sandy beach, limited on the straight side by two reefs of rock, leaving a clear entrance of 140 ft. Shipbuilding still goes on, as of old.

A strange survival of the past is found at Bedawiyeh near Tripoli. Here there is a circular tank of sacred fish, where lively shoals are continually fed by the public. It adjoins a derwish mosque, and a similar conjunction is to be found at Urfa—ancient Edessa—in North Syria. There are remaining traces of the popular worship of Atergatis or Derketo, the fish-goddess.

The city of Yarimuta, later Ramitha, was renamed Laodicea and is now Latakiah. Though it is a fine site, there seems to be no early pottery. From there, crossing the mountains, we reached Antioch, which is of Greek foundation. Thence the mouth of the Orontes was visited, where there are remains of earlier civilisations.

Early in the spring, I turned to another enterprise which might throw light on ancient Gaza. Along the coast track from Gaza into Egypt, a place of importance lies a few miles west of the frontier at Rafa. There, three *tells* were known, and marked on the Palestine Exploration map. The position, between Rafa and Rhinocolura—now El Arish—fixes the ancient name as Anthedon. That name gives the impress of its ancient character as “the flower of delights”, and Tell Jeneyn signifies “the hill of gardens.” Alas! all is now a wilderness of high sand dunes, and it proved a most awkward place for access or for work. No car could reach it, unless equipped with the widest aero tyres. On the west, El Arish is twenty miles away, and eastward Rafa, nearly ten miles. Stores were distant, water and bread supplies precarious. The mud village of Sheykh Zowaiyid boasts a police post of two rooms, and one of these with tents served as a starting point. We put up some small huts also.

The three *tells* on the map are all Hellenistic and Roman on the surface. At Tell esh Sheykh on the coast there are wide suburbs spreading half-a-mile, and at Tell Aheimer another large suburb. Tell Jeneyn, wrongly read as Ekneyin on the map, lies so hemmed round by dunes that the extent of it cannot be seen.

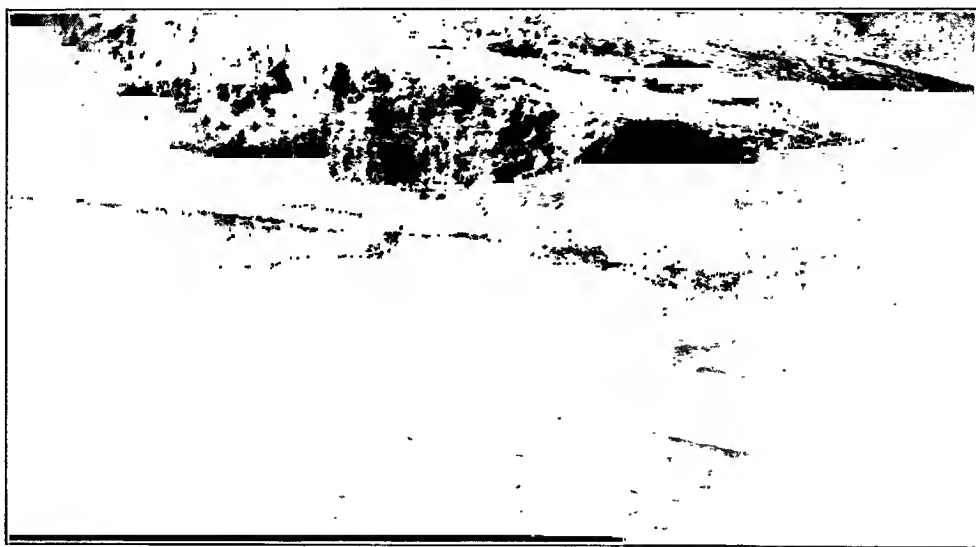


FIG. 3.—SHEYKH ZOWAIYID : WALL OF SHISHAK ABOVE EARLIER WALL WITH STEPPED BRICK APRON.

Close to Sheykh Zowaiyid a *tell*, about 400 ft. wide, is half buried by a ridge of sand dunes across the middle of it. Lines of brick fortification walls were visible, and as our first object was to see whether the site was early enough to be worth working, we began by digging down the outer side which lay exposed. At the corner of a building, the second from the top, the brick walling soon gave us a datum. A jar of characteristic XXIIInd dynasty form stood enclosed in the wall, and with it lay a stone corn-rubber, making the provision of drink and food for a foundation deposit, like that in the wall at Gerar.

Next below the XXIIInd dynasty wall of Shishak is a massive wall with a remarkable apron of brickwork over its front, descending in nine steps (fig. 3). Below, this is another wall, and yet lower a wall of yellow clay bricks, nearly demolished, with débris stamped down to form a floor. On piercing



FIG. 4.—WORK IN PROGRESS AT ANTHEDON (SHEYKH ZOWAIYID).

through this, we entered a mass of black earth settlement, the walls of which have not yet been reached. These several periods of construction earlier than the XXIInd dynasty may well reach almost as early as the first palace of ancient Gaza. The dating has not yet been verified, however, as living conditions obliged us to postpone further work for the present. A long heat wave over Palestine and Sinai reached  $109^{\circ}$  in our huts and  $120^{\circ}$  in the tents. With the shade temperature at  $117^{\circ}$ , it was getting too late to live among heated sands, and we must look forward to working down and entering the town levels on return to Sheykh Zowaiyid in the near future, when it will be possible to disentangle the history of the site. Enough was excavated to prove that the Greek city of Anthedon continued the older civilisations of a city of 900 B.C. (fig. 4), and others of four or more earlier periods.

Last autumn the usual appeal for support was not issued till there should be a definite programme. Now that prospects are opening out it is hoped that the contributions in arrears may be forthcoming, addressed either to University College, Gower Street, W.C.1, or to Beaumont House, Jerusalem, and that new donations will be a timely aid to further researches.

FLINDERS PETRIE.

## NOTES ON GLAZED STONES.

## PART II.—GLAZED QUARTZ.

THE glazing of quartz, with which are included milky quartz, quartzite and chert, is a difficult process since great care has to be taken to prevent flawing the quartz base. It was practised in Egypt during the Predynastic period and continued in use until at least the XIIth dynasty; scarabs of glazed milky quartz were made in the XIIIth dynasty. After that specimens are rare. Petrie, however, mentions a Hathor head of the XIXth dynasty. A few rather rough quartz beads with patches of blue on them are occasionally found which are identical in appearance with beads from Syria (Pl. I, 5). These beads, although not accurately dated, are said to be found with beads of the Greek or Roman period.

In Mesopotamia glazed quartz beads, which are now nearly always colourless, are found at very different dates. There are two main varieties, called the *high polish* and the *frosted*, on account of their surface at the present time. Some from Ur are supposed to date from before 3500 B.C., whilst others which are practically identical are dated to 900 B.C. These beads are not uncommon at Ur and it should be possible to settle their date. Some of a disc variety (Pl. II, 9) found in Mesopotamia also occur in a Vth dynasty necklace from Egypt, now in the Fitzwilliam Museum at Cambridge; whilst there are others of the same type, and also of another Mesopotamian type, in a string of beads in my collection, many of which are predynastic. Another specimen dated to the Old Kingdom has recently been found at Armant (1932).

Small glazed quartz shields are found at Ur (Pl. II, 6) which can definitely be dated to 2300 B.C. The technique of these is the same as that of the beads.

Glazed quartz beads are also found in Persia and Syria. Some appear to be very early. A seal of the high polish type (Pl. IV, 24), although obtained at Kadhmain, is probably Persian as it is the same shape, with the same design, as the early seals from Nihavand and Susa; it presumably dates to the third millenium B.C. Although some of the beads from Persia appear to be very early, others seem comparatively recent, and in one case suggest a mediaeval date.

Dr. Ernest Mackay tells me he has found three glazed quartz beads of the high polish variety at Mohenjo-daro. One of these is an oblate bead, another a short convex bicone, whilst the third is a lenticular cylinder, that is, a bead in which the transverse section is that of a double convex or lenticular bead, whilst the longitudinal section is that of a cylinder (fig. 1). The shape of this last bead is important, for although beads of this shape are found at the Indus Civilization site, Mohenjo-daro, they are not at present reported from Mesopotamia or Egypt. This might point to their being of local manufacture; but if that

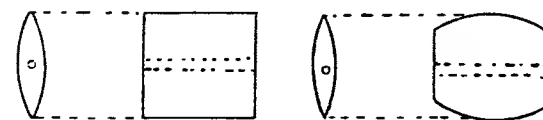


FIG. 1.

FIG. 2.



I

×1



2

×3



2a

×20



3

×3



4

×3



5

×3



5a

×50

be so it is surprising that only three have been found at Mohenjo-daro and that none have been reported from Harappa. I am therefore inclined to think that as somewhat similar beads, though lenticular barrels (fig. 2) in shape, have been found in Mesopotamia, these Indus specimens must have been imported from Sumer. If this be so, as the Indus specimens are dated to about 2750 B.C. the probability is that some of those from Mesopotamia are of the same date.

A number of fine glazed quartz specimens from Northern India are dated to the 1st century A.D. ; but there are also one or two specimens from the same site which suggest a much earlier date, and they also may have been imported from Mesopotamia. I do not know of any specimens from Europe, and even in Egypt and Asia they are rare. The process does not seem to be carried on at the present day.

Quite large specimens of glazed quartz are sometimes found. One of the finest is a Predynastic glazed quartzite mace head (Pl. I, 1). This is about two and a half inches long, and although the glaze has now broken away from half the surface the remainder is sufficient to show that it was originally coloured all over. A still larger specimen is a boat discovered by Sir Flinders Petrie. This is in several pieces that were originally joined together by wires, and it must have been nearly two feet long. Very little glaze now remains. In the British Museum is a large fragment of glazed quartzite which appears to be part of a tile. Some of the small drop-pendants of the First Intermediate period in Egypt are amongst the most beautiful specimens as regards colour, but many of them show great unevenness in the thickness of the glaze (Pl. I, 4).

With the exception of the drop-pendants the great majority of specimens of glazed quartz from Egypt are beads. In Mesopotamia the specimens are confined to beads, drop-pendants and the little shields for inlay already mentioned. In Persia also the specimens are either drop-pendants or beads, but some of the beads are panel beads of considerable size and great elaboration. An exception, probably from Persia, is the glazed quartz seal described above (Pl. IV, 24). In India, however, there are a number of small but elaborately worked pendants representing animals, such as lions. These date to about the Christian era.

All these specimens have been "glazed"; that is to say, they had had the surface coated with some material and then been heated until it melted. The method by which this was done seems to have varied in different specimens and places. All the specimens from Egypt, except a few which I believe to have been imported, appear to have had an already made glaze or else the ingredients to make a glaze powdered up and applied to the surface, and then to have been fused. Some of the specimens from Mesopotamia appear to have been treated in the same way, but there are a number from that country and Persia which were glazed by a different method. To these an alkali only was applied instead of a glaze; they were then heated until the alkali fluxed the surface by combining with the silica of the bead and flowed over the surface. These beads have an extremely *high polish* which was at first attributed to sand polish, but a careful examination soon proved that this was not the case.

Another variety of quartz bead found in Mesopotamia is the *frosted* quartz bead. This has the surface completely covered with small conchoidal fractures, and generally only slight signs of having been glazed. A careful examination, however, convinces me that this also is a variety of glazed quartz. It was produced by a combination of the Egyptian and the "high polish" techniques. These techniques are described later.





6 ×3



7 ×3



7a ×8



8 ×3



8a ×62



9 ×3



10 ×15



11 ×3



12 ×3

After examining a large number of specimens, I have selected 28 for illustration which are either typical or show some special feature: four from Egypt, one from Syria, sixteen from Ur, two from Nineveh, and five from Persia.

The numbers in the list of these specimens on pp. 29 ff. correspond with the numbers of the illustrations. If there are two illustrations of the same specimen they are numbered 2, 2a.

As already stated, the Egyptian beads appear to have had a glaze added which had been previously made and coloured. To ascertain what materials were used for this glaze, I consulted Sir Herbert Jackson, K.B.E., who very kindly made some experiments for me. One experiment was to test the glaze on a Predynastic Egyptian glazed chert bead (Pl. I, 2). This bead had a very heavy glaze which had run into lumps or drops, and had picked up a fragment of stone from the bottom of the furnace. The glaze was a typical bright blue, except in the lumps where it was almost black. As on most Egyptian specimens, the glaze had broken away over a considerable part of the surface.

Sir Herbert Jackson says: "I have examined spectroscopically the bead to which you have referred on several occasions, viz., the one labelled Egyptian glazed quartzite bead, the glaze being of a blue-green colour. The evidence for copper is definitive and conclusive. The amount of sodium present is very much more than is to be found in any specimen of crystalline quartz. The amount of calcium present is merely a trace and in most specimens of quartz that I have examined I have seen about the same amount of calcium. We may take it, therefore, that the glaze contains, in addition to the silica from the quartz, copper and sodium." This seems conclusive evidence that in this type a sodium glaze coloured with copper was used, in fact an ordinary blue copper glass.

Pl. I, 2a, shows a section through this bead; the glaze appears as a thick layer round the chert, varying in thickness in different parts. Examination by polarized light shows that this layer is isotropic and that it is therefore a glass.

The next experiment was to find out what flux had been used to make the glaze of the *high polish* beads flow over the surface. I sent Sir Herbert Jackson a portion of a bead exactly like no. 8 in Pl. II, which seemed a quite typical specimen of the high polish variety from Ur. A casual look at beads of this sort suggests that they were ground and polished in the ordinary way by friction, but a close examination at once shows that the surface has been in flow. This is clearly shown in Pl. II, 7, and is also seen in some of the others illustrated.

As the base of Egyptian faience consists of quartz grains fused together with a little lime, I asked Sir Herbert Jackson whilst testing the specimen to look out specially for calcium.

He replied: "There is no evidence of calcium in the quartz. In fact there is less calcium in that piece of quartz than in two or three other pieces of quartz which we examined at the same time. None of the other pieces of quartz, however, showed anything like the enhanced brilliancy of the sodium lines as seen from your piece of quartz bead.

"There is no doubt in my mind that that piece of quartz contains a marked amount of sodium, and that the sodium is probably mostly on the surface, since the brilliancy of the sodium lines is at its greatest when the electric arc is first struck, and fades away to such an extent that, when the fused globule has become rather less than half it was when first fused, the sodium lines do not differ greatly in brilliancy from those seen in samples of, e.g., Madagascar quartz. I am



13



14

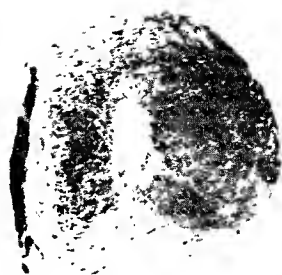
×3

×3



17

×3



16

×3



15

×3



18

×3



18a

×62



19

×3



20

×3



21

×3

aware that the argument for glazing with some sodium compound is not impregnable, but the evidence about absence of calcium in sufficient quantities to produce a glaze is definite, and the evidence in favour of any glaze effect being produced by sodium is more than presumptive."

This settled the alkali used in two varieties, so I then sent Sir Herbert Jackson one of the *frosted* variety from Ur. In this case also he found considerable traces of soda in the surface of the quartz. From these results it seems probable that a soda glaze was always used for this purpose.

Owing to the fewness of the specimens of Egyptian glazed quartz that I have been able to examine, and the almost complete absence of unfinished ones, I cannot say with certainty how they were made, but I think they were first ground to shape, then perforated, then glazed. An exception, in a necklace from Abydos, is some glazed quartz pendants which had not been perforated but had had loops fused on to them, rather like the tooth beads from Nineveh referred to later.

A typical example of the Egyptian glazed quartz bead is shown in Pl. I, 3, where a slight magnification shows the beads to be covered with a vitreous layer. This, however, is much thinner than in Pl. I, 2, and as the base is transparent crystal it gives a very beautiful pale colour.

The glazed quartz pendant (Pl. I, 4) is also a very typical Egyptian example. In this case the glaze has a crackle effect all over, showing that the coefficient of expansion of the glaze is different from that of the quartz. This tends to make the glaze flake away and accounts for the fact that in so many specimens the glaze has entirely disappeared. From this pendant pieces have flaked off, but not to the complete depth of the glaze. In these specimens the surface left on the quartz is quite distinctive; it is polished, but not nearly so highly as on the Mesopotamian high polish specimens.

The Mesopotamian beads give us evidence of a more complicated process. These beads, whether of the high polish or frosted variety, appear to have been first ground to shape and then to have had the surface hammered so as to cover it with conchoidal fractures. After this it seems frequently to have been necessary to touch up a few parts by grinding. The bead was then perforated, and finally glazed. This I have discovered by the examination of a number of specimens, several of which are unfinished.

The difference between the *high polish* and the *frosted* beads seems to have been only that, whereas the latter had a completed glaze powdered and applied to them, the former had an alkali only added which formed the glaze by combining with the quartz of the bead. The object of frosting the surface seems to have been to give a greater surface for the alkali or glaze to work on. In the case where an alkali only had been added, this seems to have attached itself so firmly that it never flakes off, whereas in the cases where a glaze had been added, it seems to have flowed at a temperature too low to attach itself properly and has generally almost entirely disappeared.

The high polish specimens were at first said to be sand-polished; but when they are carefully examined one can see that many of the little shields have had pieces at the ends evidently ground off after glazing so as to make the shields fit into the pattern of the inlay. As these parts are in some cases the most prominent, it is obvious that they could not have been left unpolished if the remainder had been polished by sand.

I have several reasons for saying that beads were ground before frosting.

One is that the shape of some of the larger ones is so accurate that I do not think they could have been made by simply chipping them down. This especially applies to beads such as no. 13 in Pl. III, a pentagonal circular bead. What is perhaps a more definite proof is shown by the bead no. 14 in the same plate and the pendant no. 15, both unfinished, on which series of conchoidal fractures are seen merging into the edge of a ground patch. Some of the fractures have not yet broken away from the grey surface, which is on a slightly higher level than the frosted portion.

It has been suggested that the grey patches remaining on these beads are part of the original surface of water-worn pebbles. In some cases this might be possible, but in others it is quite impossible.

That the surface has been in flow is shown on most of the high polish specimens. In some cases, as in Pl. I, 5a, the flow has not covered a grey patch and can be seen on the edge of it like a wave.

The fact that the frosting was done before glazing, and has not been caused by the breaking away of the glaze due to contraction, is shown in Pl. II, 10, where the glaze has not flowed over a small patch in which there is a conchoidal fracture that could not have been made after the glaze was there. Also, in some of the Mesopotamian and Persian high polish specimens the remains of conchoidal fractures can be seen covering a large portion of the bead, but completely under the glaze, *e.g.*, in Pl. II, 11, and round the edge of Pl. IV, 24.

The fact that the perforation was done after frosting is shown by the number of specimens found which are frosted and not perforated, also by the beads which were broken during perforation. In no. 17 in Pl. III, the perforation had just been started and the bead then discarded, probably on account of a large chip on the surface where the perforation would have come out.

The perforation was done with a hollow rotating drill. Another curious feature is that it was generally drilled straight through from one end, with the result that there is often a large chip where it broke through at the second surface. The pendant, no. 15 in Pl. III, is exceptional in that the perforation was started from both sides; the pendant apparently broke just when the two perforations were meeting. In this case, although a rotary drill was used it is not possible to say if it was hollow.

Amongst the unfinished beads which do not seem to have been glazed the surface is mostly frosted, with only a few small grey patches. A good many of the finished specimens, however, have small grey patches which are not covered over with glaze, but only one has a patch of frosted surface not covered (Pl. II, 10). This suggests that the alkali when put on alone flows more easily on the conchoidal fractures, which probably explains why the frosting was done.

If the high polish beads took an alkali into their surface, it must have had the effect of turning the surface into a kind of glass. If this be so, it is very curious that these beads should apparently have complete freedom from corrosion; they seem to corrode no more than natural quartz, whereas glass of that age always shows signs of corrosion and most specimens from Mesopotamia are in a hopeless state of decay.

To see if I could get a further proof of an alteration to the surface of the bead due to an alkali, I cut a section through the same bead that was tested by Sir Herbert Jackson (Pl. II, 8a), and also through a milky quartz specimen (Pl. III, 18a). Although there is no alteration near the surface that can be



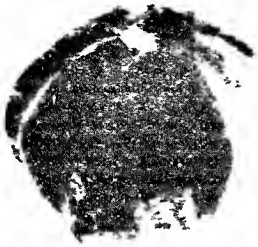
22      ×3



23      ×3



24      ×3



25      ×3



26      ×3



27      ×3



28      ×3

## PLATE IV.

detected when examined under a microscope in ordinary light, when polarized light is used a distinct difference is noticed. The edge is a different colour. This may be due partly to a bevelled edge or to reflection, but I think it is chiefly due to the soda that had been introduced into the silica. The effect seems to penetrate further in the milky quartz than in the clear quartz specimen.

The frosted beads are so free from glaze that at first I was very doubtful

whether they had been glazed, but an oblate bead (Pl. III, 16) has a large patch of coloured glaze remaining. Close examination has also shown minute pieces of decomposed glaze in some of the crevices.

The Mesopotamian glazed quartz beads are frequently regular in shape; the most typical are the oblate to spherical and the disc forms. There are, however, a few which are absolutely irregular (Pl. III, 21). These appear to be roughly broken pieces of quartz which were perforated and then glazed, as there are remains of corroded glaze in many of the hollows. The surface of these is intermediate between the high polish and the frosted.

Two other Mesopotamian specimens illustrated (Pl. IV, 22, 23) differ somewhat from the others, and may have a different technique. They come from a curious hoard of beads that Dr. Campbell Thompson discovered three years ago, and are supposed to date to as early as 2900 B.C. The tooth bead (Pl. IV, 22) is the most interesting; it is a piece of quartzite roughly chipped to shape and then mounted in a piece of faience so as to represent a tooth. The whole was then fired, and the glaze from the faience seems to have completely covered the quartzite block. The other, Pl. IV, 23, was made in a similar way, but instead of one large block of quartzite a considerable number of smaller ones were inserted. In this case also the glaze covered the pieces of quartzite.

Some of the Persian glazed quartz is very similar to the high polish Mesopotamian, and was probably made in the same way. Nos. 27 and 28 in Pl. IV, which come from Shah-i-Bilqis, are typical of a number of specimens, many of which are dated to at least as early as the third millenium B.C., and probably earlier.

The seal, Pl. IV, 24, is also supposed to be early. Though bought in the market at Kadhimain, it is exactly the same shape and has the same pattern as seals from Nihavand, and is probably Persian.

The panel beads, Pl. IV, 25, 26, are undated. No. 25 was bought with a number of other glazed quartz specimens on a string which is stated to have come from Rhagae. On the same string were a quantity of glass beads, many of which date from the eighth to third centuries B.C. No. 26, bought in Tehran, resembles several on the same string as no. 25; I have also a very badly made specimen from Egypt that was in the Amherst sale. I do not know the date of these specimens, but one of them suggests mediaeval work.

The question as to whether the high polish and frosted specimens of glazed quartz were all coloured is a difficult one. There are certainly remains of colour on quite a number of the high polish beads, and the bead and pendant of milky quartz, Pl. III, 19, 20, were evidently coloured over a considerable portion of the surface. These, although they have a fairly bright surface, are not, however, quite as bright as the majority of the high polish beads, and I think they were made in the same manner as the Egyptian specimens. The colouring matter on no. 20 is very like cobalt, and the way it was applied suggests that it may have been put on as a second process.

Another specimen which has a great deal of colour distributed over it is the bead from Shah-i-Bilqis (Pl. IV, 27). Here part of the glaze, which seems to be cobalt, is a bright deep blue, but other parts have corroded to brown. On the pendant (Pl. IV, 28) from the same site all the remains of glaze are a brown colour. This is important, as it shows that the small brown patches to be seen in the hollows of most of the high polish beads are the remains of a coloured glaze.

The little glazed seal (Pl. IV, 24) from Persia suggests another possibility. The cross grooves are partly filled by a blue glaze which has the appearance of a semi-fused powder, whilst the remainder of the surface has a very high polish. This suggests that the coloured glaze was added after a previous alkali treatment had polished the surface. If this be the case, and the colour had been added as a second process at a much lower temperature, it would explain why in so many cases the colour has completely disappeared.

Several of the high polish beads from Ur show small patches of colour, and a larger number show small brown remains of decomposed coloured glaze.

If, as seems probable, the colour was generally put on as a separate process, it is possible that some of the high polish beads were not coloured; but from the number that have only a slight trace remaining I think it very probable that they were all coloured.

The frosted beads were also in my opinion coloured. The large patch on bead no. 16 in Pl. III makes it quite evident that it was coloured, and minute traces of colour in the conchoidal fractures of a number of specimens point to the same fact. In these beads the colour was probably added as a glaze.

The colour of all the beads referred to above is either blue or green, except where most of the glaze has gone and the few fragments that remain have corroded into a dull brown. There were two varieties of blue glaze used, one a pale blue coloured with copper, the other a much darker blue, sometimes, and probably always, coloured with cobalt.

The tooth beads (Pl. IV, 22) and crumb beads (Pl. IV, 23) from Nineveh show traces of a red glaze. An examination of several tooth beads showed that there is no evidence of conchoidal fractures or of uncovered grey patches. One, however, bears the remains of a blue glaze, and another of a pinky red glaze.

The crumb beads had been heated sufficiently to cause a considerable flow on the surface. Two specimens had portions covered with red glaze, two with blue glaze, and one specimen had remains of both red and blue glazes, of which the blue glaze appeared to be under the red.

Of the faience beads found with them in the bead layer some bear the remains of a very intense red glaze. The colour of this glaze has been proved to be due to copper, and the colour of the red glaze on the pieces of quartz in the tooth and crumb beads is probably due to the same metal.

## PLATE I.

### EGYPT.

Fig. 1. Glazed quartzite mace head. Predynastic.

Photo. No. 43

Half this specimen is covered with a greenish glaze, which originally covered it completely. It is one of the largest pieces known.

Ref. No. B/2223  
Natural size.

Fig. 2. Glazed chert beads. Predynastic.

Photo. No. 119

The glaze, which is very thick, has formed large blobs, one of which has picked up a piece of stone from the floor of the furnace. The colour is a fine blue.

Ref. No. B/331  
( $\times 3$ )

Fig. 2a. Section of one of the previous beads.

Photo. No. 169

The glaze shows as a thick layer round the stone which has somewhat the consistency of an agate. Under polarized light, the glaze shows as an isotropic material, viz., a true glass.

Ref. No. B/331  
MS. 452  
( $\times 20$ )



Fig. 3. Glazed quartz beads. Predynastic.

These beads are covered with a thin layer of pale blue, vitreous glaze, which has flaked off in places.

Photo. No. 120  
Ref. No. B/331  
(×3)

Fig. 4. Glazed quartz drop-pendant. First Intermediate.

A typical specimen of the glazed pendants of this period. The glaze, which is of a very fine colour, is crackled all over owing to the unequal coefficients of expansion of the glaze and base.

Photo. No. 113  
Ref. No. B/1582  
MS. 630  
(×3)

## SYRIA.

Fig. 5. Bead of glazed quartz. Aleppo.

This bead, of which a large portion is covered with a cobalt blue glaze, is a type which is found both in Egypt and Syria. Although not accurately dated, beads of this type are sometimes associated with beads of the Greek and Roman periods.

Photo. No. 139  
Ref. No. B/1266a  
(×3)

Fig. 5a. Fragments of glaze from specimen no. 5.

Photo. No. 181  
Ref. No. B/1266a  
MS. 45-7  
(×50)

## PLATE II.

## MESOPOTAMIA.

Fig. 6. Glazed quartz shield. Ur.

These little shields of the high polish, Mesopotamian glazed quartz were at first thought to be sand-polished. It is evident, however, in many of them that the edges have had little portions ground off to make them fit. This had been done after polishing. In some cases definitely dated to *c.* 2300 B.C.

Photo. No. 118  
Ref. No. B/1575  
(×3)

Fig. 7. High polish glazed quartz pendant. Ur.

This little pendant, which has a very high polish, has also a number of small grey patches where the glaze did not flow. The glaze seems to have flowed to a considerable depth; it finishes up on some of the grey spots like a wave, as is shown more clearly in fig. 7a.

Photo. No. 114  
Ref. No. 2053f  
MS. 629  
(×3)

Fig. 7a. An enlarged photograph of part of no. 7.

It is possible that in this case the frosting process was omitted or only done over a portion of the bead. Although the glaze seems to have flowed to a considerable depth it has not covered several ground patches (grey). These are distributed over various parts of the pendant, but show no signs of conchoidal fractures. Another possible explanation is that in this case the frosted surface had been very extensively touched up by grinding before the bead was glazed.

Photo. No. 145  
Ref. No. B/2053f  
MS. 629  
(×8)

Fig. 8. Broken specimen of the spherical, high polish type. Ur.

It is included here as it is typical and shows the inequality of the surface due to the way in which the glaze had flowed. Although not definitely dated, is thought to be early.

Photo. No. 166  
Ref. No. B/2276b  
MS. 634  
(×3)

Fig. 8a. Section of the bead that was tested by Sir Herbert Jackson. It shows a change of colour near the edge when examined in polarized light. This is not caused by variation of thickness due to a badly ground surface

Photo. No. 172  
Ref. No. B/2052a  
MS. 453  
(×62)

being rubbed off at the edge ; the wasters used in grinding would prevent this, and also a very great difference would be necessary. Though it may be partly due to fracture of the edge at an angle, I think it is the result of a real difference in the refractive index of the quartz at the edge due to the absorption of the soda. A slight difference could also be seen at the edge of a thinner section.

Fig. 9. Disc-shaped bead of the high polish variety ; one of the commonest forms.

Photo. No. 140  
Ref.No.B/1557b  
(×3)

Fig. 10. Fragment of a highly polished, transparent glazed quartz bead. Ur.

Photo. No. 176  
Ref.No.B/2276a

It has a patch where the glaze has not run, and in this patch is a portion of a conchoidal fracture which must have been there before the bead was glazed. This shows that the frosted surface must have been made before glazing ; this particular conchoidal fracture could not have been made afterwards.

MS. 633

(×15)

This question is of some importance, as at first I thought that the frosted surface might have been made by the flaking away of the quartz surface together with the glaze, owing to different coefficients of expansion and changes of temperature over a long period.

Fig. 11. Pendant of high polish type. Ur.

Photo. No. 168  
Ref.No.B/2275b  
MS. 636  
(×3)

A comparatively large and very transparent pendant showing the conchoidal fractures of the frosted surface only partially melted out, although the surface had flowed considerably.

Fig. 12. Half-bead of transparent glazed quartz. Ur.

Photo. No. 132  
Ref.No.B/2275a  
MS. 635  
(×3)

This bead appears to have been broken either before or during firing, as the fractured surface is glazed and there is considerable rounding of the broken edge of the perforation. A curious marking over the broken surface may be the result of the firing when it was broken or may be some form of corrosion. Alternatively, this marking may be due to sand-polish.

### PLATE III.

Fig. 13. Frosted pentagonal circular bead. Ur.

Photo. No. 124  
Ref. No. B/2058  
(×3)

This is the most perfect form of frosted bead that I have seen. The surfaces are so regular that I do not think it could have been made with such accuracy unless it was ground to shape first. Even then the frosting would require care. Possibly it was done by rumbling with a number of other beads or pebbles.

Fig. 14. Fine specimen of frosted bead. Ur.

Photo. No. 116  
Ref.No.B/1556b  
(×3)

A large grey (ground) patch which is not frosted appears to be on a higher level than the frosted part, and in one place a flaw goes under the grey portion, but has not yet broken away. Hence it is evident that the grey surface was made first and the frosting done afterwards.

Fig. 15. Frosted pendant, broken at the perforation. Ur.

Photo. No. 141  
Ref.No.B/2251b  
(×3)

This specimen also shows conchoidal fractures breaking into a grey patch. The perforation had been started from both sides with a rotating

drill, but there is no evidence as to whether the drill was hollow. The two holes appear just to have met before the top part was broken off. There is a rounded grey patch on one side. On considering whether the grey patches left on so many of these beads could be the result of leaving part of the natural surface of a pebble, I came to the conclusion that in this case it was extremely improbable, whilst in other cases it was quite impossible.

Fig. 16. Frosted bead with patch of glaze. Ur.

Photo. No. 115  
Ref. No. B/2274  
MS. 647  
( $\times 3$ )

This is the only frosted bead that I have seen with any large patches of glaze remaining. A quite big patch of a rather greenish colour is definite proof that these beads were sometimes glazed; moreover, several others show minute traces of decomposed glaze in the crevices of the conchoidal fractures.

Fig. 17. Frosted bead with unfinished perforation. Ur.

Photo. No. 117  
Ref. No. B/2273  
MS. 638  
( $\times 3$ )

The perforation had been only just commenced with a tubular drill. A grey patch opposite the perforation may be part of the original surface of a pebble, but it is most improbable. A flaw nearly across the bead from the commencement of the perforation is probably the reason why the bead was discarded unfinished.

The frosting had obviously been done prior to the perforation. Several small frosted balls that have been found without any perforation are probably unfinished beads. The perforation in all cases seems to have been done before glazing.

Fig. 18. Milky quartz bead. Ur.

Photo. No. 142  
Ref. No. B/1555  
( $\times 3$ )

Elliptical oblate in form.

Fig. 18a.

Photo. No. 175  
Ref. No. B/1555  
MS. 456  
( $\times 62$ )

Section of the last specimen to test whether the surface was optically different on account of the soda which had been shown to be there by means of the spectroscope. As expected, the effect could be seen in polarized light; it seems to extend in for a considerably greater distance than in the clear, high polish bead, no. 8a in Pl. II.

Fig. 19. Coloured milky quartz bead. Ur.

Photo. No. 143  
Ref. No. B/2049a  
MS. 642  
( $\times 3$ )

This bead has a large number of patches of coloured glaze remaining on it, and it looks as though the whole surface was originally glazed. The patches that remain are in most cases very broken, and those that look like the original surface of the bead are very crackled. The surface of the colourless portion is slightly grey when examined with a magnification of 250. The surface of most of the beads examined showed this slight greyness, but it was much less in the high polish beads.

Fig. 20. Milky quartz pendant (coloured). Ur.

Photo. No. 144  
Ref. No. B/2272  
MS. 637  
( $\times 3$ )

The colouring matter of a large number of dark blue patches I believe to be cobalt, though I am not certain. The colour-glaze is very patchy and the bigger pieces have a large number of circular holes right through which are probably due to bubbles. In addition to the large patches, there are a great number of small pieces of blue glaze remaining

in the cracks. This points to a large portion of the surface having been originally coloured, though I am not certain whether the whole surface was, as many of the large pieces of glaze look as if they are now in the same condition as when they were originally fused.

Fig. 21. Irregular quartz bead. Ur.

Photo. No. 146

One of the rough fragments of quartz which had been perforated and apparently glazed. Some specimens are much greyer than this one, and others show signs of conchoidal fractures over a part of the surface. One would be inclined to think them unfinished beads except for the fact that they show definite signs of having been glazed.

Ref.No.B/1558b  
(×3)

#### PLATE IV.

Fig. 22. Imitation tooth bead. Nineveh.

Photo. No. 123

Apparently an imitation of a molar tooth. A large piece of quartz is mounted in a piece of material similar to Egyptian faience. There is no sign of conchoidal fractures or of uncovered grey patches, and possibly the glaze had run down from the faience top. The perforation is in the faience. This bead is from the so-called "bead layer" at Nineveh, where an immense number of beads were found. As a number of these beads were similar to some of the very early specimens from other sites in Mesopotamia, it is probable that they are not much more recent than 2900 B.C.

Ref. No. B/2108  
(×3)

An interesting point is that one quartz specimen showed signs of a red glaze. As the red glaze on some of the faience from the same collection of beads was coloured with copper, it is probable that the red glaze on this and no. 23 in the same plate owes its colour to copper.

Fig. 23. Crumb bead. Nineveh.

Photo. No. 121

This bead is very similar to the last save that a number of smaller quartz pieces had been inserted instead of one large one. The use of different colours for glazing is much more marked here. Some specimens are definitely blue, and others red, whilst one has red and blue on the same bead, the blue glaze apparently under the red in some parts. As in no. 22, the firing seems to have been sufficiently hot to cause a good deal of flow on the surface.

Ref. No. B/2109  
(×3)

Fig. 24. Glazed seal, probably Persian. Bought at Kadhimain, near Baghdad.

Photo. No. 122

In design and shape this seal is similar to seals found at Nihavand and Susa, and it is, I think, probably of Persian origin. The cross on the flat surface is partially filled with a coloured glaze. This looks as though it was applied as a powder and had not completely melted. As the other portions of the surface where there is no colour show signs of a large amount of flow, probably needing great heat, I think that this coloured glaze must have been added as a later process. The rounded edge where the curved and flat surfaces meet show signs of conchoidal fractures not completely melted.

Ref. No. B/2071  
(×3)

Fig. 25. Oblate sector, panelled bead. Rhagae, Persia.

Photo. No. 129

This specimen is almost entirely covered with a bright blue glaze, probably due to copper. There is no evidence as to its date, but it was

Ref. No. B/114  
(×3)

bought with a number of glass beads dating to between 800 and 300 B.C.

The method of manufacture is probably the same as in the Egyptian beads.

Fig. 26. Bead with U-shaped panels. Teheran.

Photo. No. 130  
Microslide 641  
( $\times 3$ )

This bead is of similar technique to the last from Rhagae, and I have also a specimen, very roughly made, from Egypt.

The blue glaze which had been very thick has mostly flaked away. A large number of bubbles on the surface of the quartz show that the whole surface was originally covered with glaze.

Fig. 27. Quartz bead with blue glaze. Shah-i-Bilqis, Persia.

Photo. No. 131  
Ref. No. B/2078  
( $\times 3$ )

This is a rough, high polish bead with numerous patches of dark blue. The colouring-matter appears to be cobalt. The coloured glaze is full of air bubbles, and the colourless portion looks as though it originally was covered with a coloured glaze which has flaked off.

Fig. 28. Quartz pendant with corroded remains of coloured glaze. Shah-i-Bilqis, Persia.

Photo. No. 147  
Ref. No. B/2078  
( $\times 3$ )

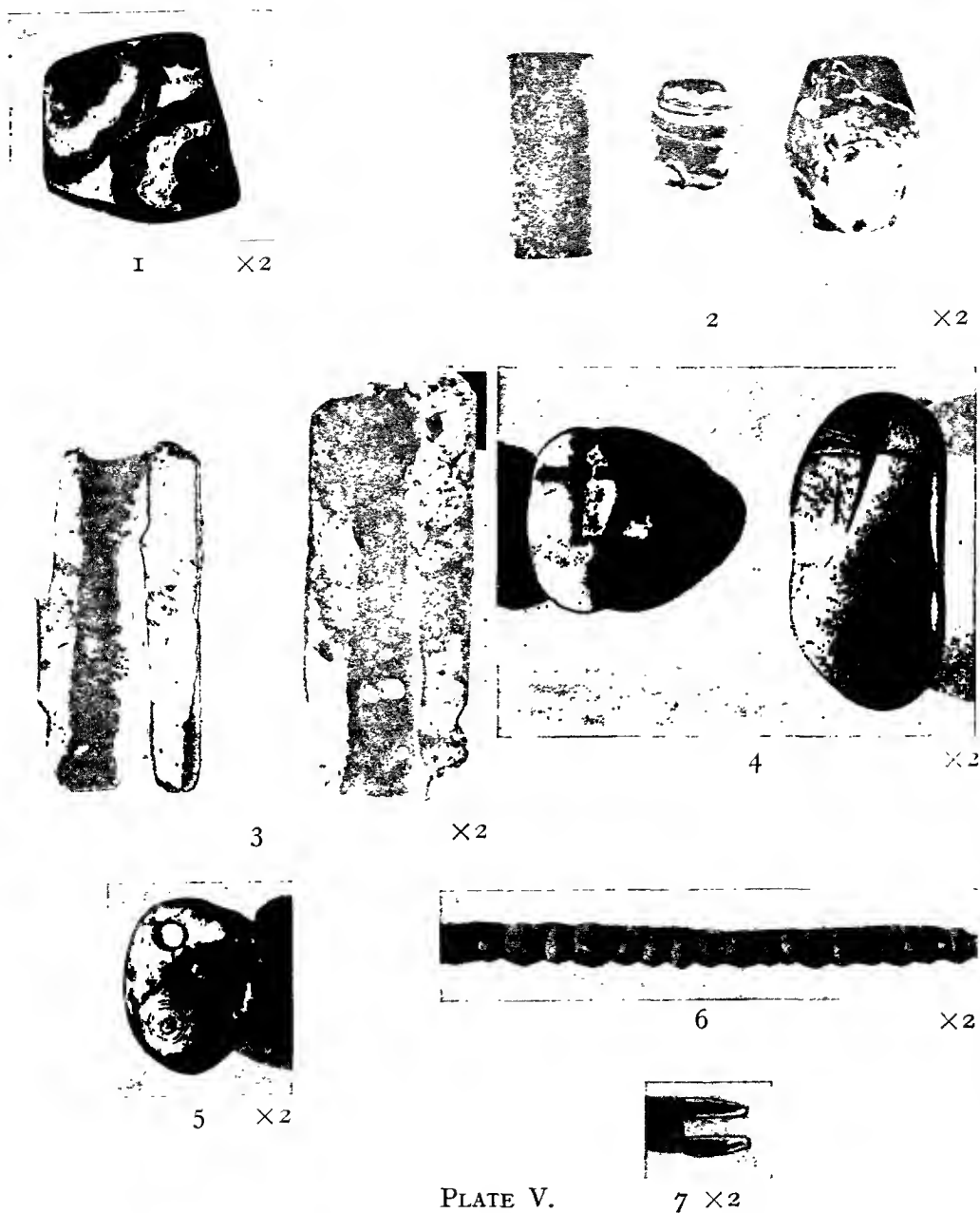
This pendant is from the same string as the last, and they were probably found together. It has a large number of patches of glaze on it, but except for one minute spot the glaze has everywhere corroded to a dull, pale brown colour. This bead and others on the same string, including no. 27 in Pl. IV, which are practically colourless, all show signs of conchoidal fractures or frosting, now partially obliterated. I believe these beads to be of very early date.

### PART III.—CARNELIAN, AGATE, AND FELSPAR.

In addition to steatite and quartz, other stones were chemically treated. The most important of these are the etched carnelians, agates, and chalcedonies. These were not actually "glazed," but had a special treatment in which soda was added, though usually as a decoration and only over a small portion of the surface. (See Ernest Mackay, *Decorated Carnelian Beads*, MAN, 1933; and H. C. Beck, *Etched Carnelian Beads*, *Antiquaries Journal*, Oct., 1933.)

In addition to these, a considerable number of carnelians in various countries have a white patination over part or all of their surface. In some cases they appear to have been purposely whitened by means of soda, whilst in others they have probably been discoloured by the action of the soil in which they lay buried.

The soda treatment has a very different effect on different stones, and on different layers of the same stone, those layers which most resemble crystalline quartz being least affected. This method has sometimes been used to heighten contrast in beads. The bead was first cut so that the different layers gave the desired pattern and then a soda treatment was employed to enhance contrast making one layer white whilst the other remained its original colour. Pl. V, 1, shows an eye-bead from Ur which was treated in this manner; it is impossible to believe that in this bead the colouring and pattern are accidental. In this case the whitened parts are white to the centre of the bead.



A large number of beads from Mesopotamia and a few from Egypt have patches of white patination on them. This is sometimes so extensive that the whole surface is white, but it is more usual for the patination to extend over only a portion of the surface (Pl. V, 2). In some cases the patination follows the structure of the stone, whilst in others it does not. Beads with heavy patination are rarely found in Egypt, and even in Mesopotamia, where patinated beads are much more common, completely white specimens are comparatively rare, whilst a great number of the earliest beads show no trace of patination at all.

Spectroscopic examination proves that this patination is due to soda and it appears to be the same as the white layer of the etched beads. A microscope

section shows a very similar structure, the alternate light and dark layers being clearly visible.

It is very difficult to decide whether patination was produced by accident or on purpose, but I have come to the conclusion, after examining a great many specimens, that in most cases it was accidental, and probably due not to any special treatment that the bead received during manufacture but to some peculiar circumstance of its burial. One proof that the patination sometimes occurs after burial is provided by the broken cylinder bead, no. 3 in Pl. V. There is considerable patination over the fractured surface, and totally different amounts on the parts of the perforation which fitted together before it was broken. It is improbable that this bead was broken long before burial, in which case the discoloration must be due to treatment received during or after burial. The possibility of its being due to cremation has been suggested, but this seems very improbable, as, if the bead had been treated in such a way as to break it, probably more damage would have been caused to the stone and the very fine colour of the unpatinated part spoilt.

It is difficult to explain why this patination should appear on some beads whilst the great majority of early beads from Egypt and Mesopotamia show no signs of it. I have not noticed patination on Indian specimens, but have seen very extreme cases of it from Persia; and a bead from Lake Guatavita in Colombia, South America, has decided signs of it.

Spherical, banded agate beads from Persia also show signs of some chemical treatment; when not too heavily done it has the effect of heightening the contrast of the bands.

In Predynastic Egypt a number of pendants were made of a material generally called "burnt pebbles." I think that these are a silicate stone and closely allied to carnelian. They show no sign of glaze; they are usually opaque white and brown, nor is the surface very highly polished (Pl. V, 4).

One carnelian pendant, however, with a very fine pattern of circular dots or eyes (Pl. V, 5), has a brilliant glazed surface and the original bright colour of the stone has not been lost. The perforation was made after glazing. It might be suggested that the glazed surface is due to sand-polish; but this is improbable, for, in the first place, it shows spots very suggestive of glaze, and, secondly, if it was sand-polished it must have been done before the perforation. Also, the way in which the stone chipped during perforation makes it look as though it had been flawed in glazing. The provenance of this specimen is unfortunately uncertain, but it is stated to have come from Egypt.

I have tried a variety of experiments to produce a glazed stone of this sort, but although it is easy to get a very highly polished white surface, I have been quite unsuccessful in producing a highly polished surface without damaging the colour of the stone.

\* \* \* \*

In one of the graves in the Wynaad, South India, excavated by Mr. Cammiade, he discovered a number of beads of various shapes made of orthoclase felspar. These are quite white on the surface, but the centre of the bead has a red colour not unlike carnelian.

This discoloration of the outside extends for a considerable distance into the stone and is probably due to the action of some chemical, but there is not yet sufficient evidence to show whether it was done purposely whilst the bead was being made or was produced accidentally after burial.

PLATE V.

- |   |   |
|---|---|
| Fig. 1. Bead. Ur. The stone has been so cut that the natural structure has been used to make eyes, and the colour contrast has been artificially enhanced.  | Photo. No. 245c<br>Ref. No. B/1531<br>( $\times 2$ )  |
| Fig. 2. Patinated stone beads. Ur.<br>(a) Complete patination ; carnelian.<br>(b) Patination enhancing natural structure over a portion of the bead, probably accidental : chalcedony.<br>(c) Irregular partial patination : carnelian. | Photo. No. 298<br>Ref. No. B/2525<br>( $\times 2$ )   |
| Fig. 3. Carnelian cylinder bead from Ur, showing patination over fracture and unequal patination over adjoining parts of perforation.   | Photo. No. 69<br>Ref. No. B/1269b<br>( $\times 2$ )   |
| Fig. 4. "Burnt pebble" pendants. Egypt.   | Photo. No. 294b<br>Ref. No. B/2229<br>( $\times 2$ )  |
| Fig. 5. Glazed (?) eye pendant. Egypt (?).  | Photo. No. 294a<br>Ref. No. B/2563<br>( $\times 2$ )  |
| Fig. 6. Discoloured orthoclase felspar beads. S. India.   | Photo. No. 299a<br>Ref. No. C/15751<br>( $\times 2$ ) |
| Fig. 7. Section of half an orthoclase felspar bead.<br>H. C. BECK.  | Photo. No. 299b<br>Microslide 640<br>(.2)             |

GEOMETRICAL ORNAMENT ON ARCHAIC EGYPTIAN POTTERY.

EXCAVATION has recently discovered in different countries many remains of pottery vessels with geometrical ornament. The patterns most frequently met with are undulating lines, and triangles and rectangles whose interiors are hatched with parallel or intersecting straight lines. These designs occur on the ancient pottery of Cyprus,<sup>1</sup> and many such vessels of Cypriote origin are now in various museums, including the Moscow Museum of Fine Arts (figs. 1-4). Evans's excavations in Crete unearthed, in the Early Minoan strata I-III, similar pottery vessels with geometrical ornament.<sup>2</sup> Specimens have also been found in the Balkan peninsula at Hagia-Marina in Phocis.<sup>3</sup> But this mode of decoration is spread far more widely than the Mediterranean region: pottery vessels with similar motifs have been found in archaic tombs in Egypt, and they have proved to be typical of several archaic cultures in Asia. For similar designs have been found on pottery in south Mesopotamia and Elam<sup>4</sup>; at Tepe Hissar near Damghan (Persia), excavated by Schmidt in 1931<sup>5</sup>; at Tülü and Djönü, Armenia<sup>6</sup>; near Anau, not far from Ashhabad, Central Asia, excavated by Pumpelly<sup>7</sup>; near Kaakha, Turkistan<sup>8</sup>; at Shahi-Tump and the other excavations of





CYPRIAN POTTERY.

(MOSCOW MUSEUM OF FINE ARTS.)

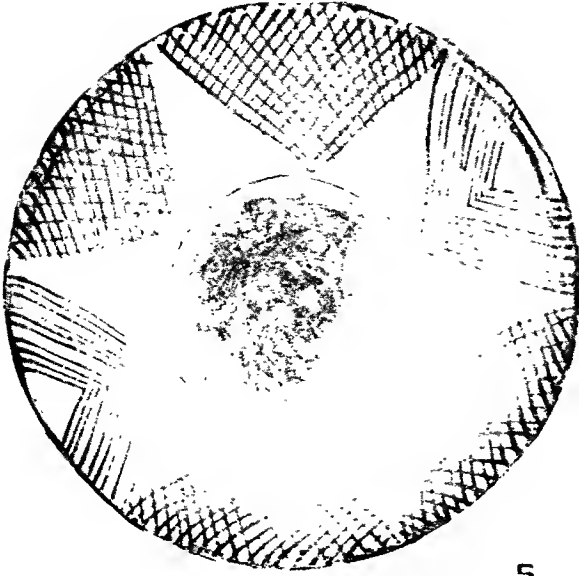
Sir Aurel Stein in Baluchistan; and in the Indus valley where, at Mohenjodaro and Harappa, an ancient Indian culture akin to the culture of old Sumer<sup>9</sup> has been discovered.

As we now possess a great number of pottery vessels and sherds ornamented with geometric designs and belonging for the most part to the Chalcolithic epoch, it is possible to proceed to the analysis of these designs. The most important part of the study is the comparison of the designs on Egyptian archaic pottery with the oldest types of hieroglyphic writing.

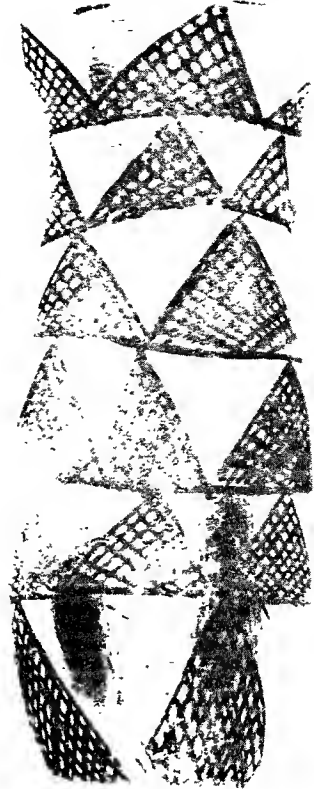
The motifs on the pottery vessels of the prehistoric period and the inscriptions of the first two dynasties and of the predynastic epoch display a very close relationship. The archaic prototype of the hieroglyph  $\downarrow$  (= *šw*),  $\downarrow^*$  (= *šw*), found in the tomb of Ka-ap<sup>10</sup> may be cited as an example. This oldest prototype of an Egyptian hieroglyphic sign differs from the earlier specimens of the classical epoch in a more detailed design of the heraldic plant of Upper Egypt (a species of reed). We see here not only the principal parts of the plant, viz., the stem and the leaves, but also the root and the flowers. The designs on the pottery of that epoch give analogous schematic and linear images of plants or trees, in which the trunk and branches of trees, or the stems and leaves of plants, are represented only by lines.<sup>11</sup> Finally, many vessels of this period bear the typical "fir" ornament, presumably the schematic representation of a plant or a tree derived from a graphical prototype.<sup>12</sup>

The examination of the typical forms of geometric ornament on archaic vessels—viz., triangles hatched inside with parallel or intersecting straight lines, or rows of wavy lines—and their comparison with the corresponding pictures and the pictorial hieroglyphs of the same archaic epoch enable us not only to detect the close inner relationship existing between these three types of graphics, but also to appreciate the semantic value of these typical forms of geometrical ornament.

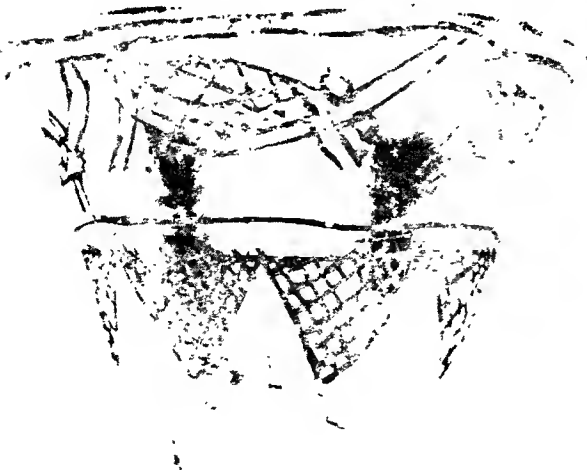
The Egyptian painter of the archaic epoch was naturally inclined to represent the forms of life and nature which surrounded him and which exercised the strongest influence upon his consciousness and his genius; he therefore attempted to depict the landscape of the country he inhabited. The triangles often found on archaic pottery vessels (figs. 5-7) are schematic representations of the earth in the broad sense of the word, or more exactly of the ground or soil. Presumably the painter tried to represent in this primitive and strictly geometrical fashion the mountainous landscape which environed him in that remote epoch when he inhabited the highlands which border the Nile valley to east and west, leading a hunter's life. Only gradually did he settle down to agriculture in oases and river valleys. Triangles representing mountains are often to be found on archaic pottery vessels, noticeably on the dish in the Moscow Museum (fig. 8), where a hunter holds four animals (dogs?) on leads. The mountainous landscape is here represented by five triangles, four of them in pairs, each of which represents two mountains separated by a valley.<sup>13</sup> On an archaic vessel in the Berlin Museum (No. 18566)<sup>14</sup> the conventional picture, almost a drawing, of two mountains with a valley between them forms but a portion of an extensive landscape composition, frequently met with on ancient pottery, in which a large boat floats on a river. On the shores of the river are animals, persons, trees, besides the typical representations of "double" mountains. This schematic method of representation had evidently become so familiar in Egyptian art that we find it even in the mural painting of the Middle Kingdom. Thus, in



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EGYPTIAN POTTERY.

(MOSCOW MUSEUM OF  
FINE ARTS.)

the tomb of Antefoker,<sup>15</sup> where the painter represents a hunting scene, the mountainous scenery is indicated by a number of triangles with smooth slopes, an evidence of the realistic aims of the art of that epoch. The rhythmical and monotonous repetition of triangles representing mountains led to the gradual transformation of a picture of mountains into the typical ornament of the pottery vessels of the archaic period. A stage in this transformation is to be observed on the Berlin vessel No. 19334. Here the double triangles are replaced by a broken line of triangles which appears to represent a mountainous and desert country and which bears a line of horned animals, perhaps antelopes or gazelles. Without these animals it would not be possible to recognize a landscape in this geometrical design.<sup>16</sup>

The same picture of a mountainous landscape is clearly recognisable in the

hieroglyphic signs  $\Delta$   $\nabla$   $\nabla$ . The conservation in these hieroglyphs of the singular, dual, and plural by mechanical doubling and trebling of the fundamental sign  $\Delta$ , mountain or hill, shows that in their oldest form these hieroglyphs go back to the epoch of pure pictorial writing, when the system of written signs possessed no means of denoting the dual and the plural by abstract determinatives. This oldest method of denoting the dual and plural in Egyptian writing, by doubling or trebling of the sign, viz.,  $\equiv = t^3wj$ , "two lands," or  $\text{𓆎𓆎𓆎} = ntrw$ , "gods," survived until the New Kingdom.<sup>17</sup> In fact, we find in inscriptions of the first dynasties the hieroglyph meaning "locality" in the form of one, two, or three mountains joined together; the hieroglyph of two mountains  $\nabla$  is met with in an inscription on an alabaster vessel from the tomb of the Pharaoh Den; and the hieroglyphic sign "locality" in the form of three hills,  $\nabla$ , is found in a number of archaic inscriptions.<sup>18</sup> In its dual form, this hieroglyph forms part of the name of the Pharaoh Senti, which means "foreigner," "Desert-man," or "Highlander."<sup>19</sup> In one of these inscriptions we can actually discern the old pictorial basis of this hieroglyph, a mountainous desert country, since the painter rendered the sand of the desert by dots, precisely as in the representation of the desert in the tomb of Antefoker.<sup>20</sup>

The semasiological analysis of the words determined by the hieroglyphs of "locality,"  $\Delta$   $\nabla$   $\nabla$ , shows clearly that these hieroglyphs were always connected with the notion of high land. The primary and simplest form, the right-angled triangle, goes back to the archaic epoch and occurs frequently in inscriptions of the Old Kingdom, viz., in the Pyramid Texts, in the inscriptions of Meir, and in the tomb of Ptahhetep.<sup>21</sup> Painted black, green or grey, this hieroglyph derives from the schematic representation of natural or artificial earth, a hill, or embankment of alluvial soil. Filled with dots, as, for instance, at Meir,<sup>22</sup> it obtains a somewhat different semantical meaning, for we are able to distinguish here its old pictorial character, the representation of the profile of desert mountains. The pictorial determinatives and the significance of words which include this hieroglyph indicate that its usual meaning was "highland." It is found in the following words in the texts of the Old Kingdom,  $\Delta$   $\text{𓆎𓆎}$   $\Delta = k^3$  (Pyr. M. 202) and  $\Delta$   $\text{𓆎𓆎}$   $\text{𓆎𓆎}$   $\Delta = k^3j$  (L.D. III. 24). The first of these words is determined by the hieroglyph of the triangular mountain and the second by the stairs, which means "high soil, high ground, heap, highland, hill," and particularly the first-born hill on which appeared the God and Creator, Atum. In the Middle Kingdom we find this hieroglyph in one of the Beni-Hasan Texts in the word  $\Delta$   $\text{𓆎𓆎}$   $\Delta = k^3t$ , determined by the hieroglyph of the irrigation canal, and meaning "high-situated land, hill, high field" (Griffith, *Beni-Hasan*, Part III, p. 5). Thus the hieroglyph  $\Delta$ , both by its form and its semantic signification, appears to be a generalized representation of high land, both in desert and in fertile and cultivated country.

We find this hieroglyph in its duplicated form  $\nabla$  in the texts of all epochs of Egyptian history, including inscriptions of the archaic epoch<sup>23</sup>; and in the tomb of Ptahhetep (Old Kingdom) its pictorial base is clearly emphasized,<sup>24</sup> for the painter very carefully although schematically represented with red spots the projections of red stone on the slopes of the desert mountain. The lower edge, consisting of a rectangle hatched with vertical lines and painted green, represents fertile valley intersected by irrigation canals. This hieroglyph is for the most part connected with the idea of





mountainous desert bordering the valley, for it is included in the word  $\text{𓂏} \text{𓂏} \text{𓂏} \text{𓂏} = dw$ , preserved in the Coptic  $\tau\omega\omega$ , "mountain, rock, hill," with the secondary specific meaning, "evil, useless," which is seen in the word  $\text{𓂏} \text{𓂏} \text{𓂏} \text{𓂏} = dw$ . An analogous hieroglyphic sign in the form of two joined triangles exists in the Hittite hieroglyphic inscription, the so-called seal of Tarkondemos,<sup>25</sup> and also among the Cretan hieroglyphic signs systematized by Evans.<sup>26</sup>

The triplication of the hieroglyph  $\Delta$  produced the frequently used hieroglyphic sign  $\text{𓂏}$ , representing in its pictorial form a mountainous desert country contiguous to a green, fertile valley, as has already been shown from the inscriptions of the Old Kingdom, viz., in the Tomb of Ptahhetep.<sup>27</sup> Its semantics are clearly indicated by the meaning of the words which include it. We find it as the ideogram or determinative in the word  $\text{𓂏} \text{𓂏}$ , var.,  $\text{𓂏} \text{𓂏} = h^3st$ , "mountainous country, foreign country"; in the word



FIG. 8.—EGYPTIAN POTTERY DISH.  
(MOSCOW MUSEUM OF FINE ARTS.)

$\text{𓂏} \text{𓂏} \text{𓂏} \text{𓂏} = smt$ , "desert, necropolis"; in  $\text{𓂏} \text{𓂏} = hr-t$ , "mountain rock tomb"; and in  $\text{𓂏} \text{𓂏} = i^3bt-t$ , "East." Egypt being surrounded by deserts, the word "desert" and "foreign country" are denoted by the same hieroglyph  $\text{𓂏}$ . The name of Syria,  $\text{𓂏} \text{𓂏} \text{𓂏} = Rtnw$ , is determined by this very hieroglyph  $\text{𓂏}$ . And, accordingly, the name of the god of the desert foreign land was determined by the same sign  $\text{𓂏} = H^3$ , var.,  $\text{𓂏} \text{𓂏} \text{𓂏} = H^3$ . Lastly, the same hieroglyph is seen in the name of the 6th nome of Lower Egypt,

Xois, ,<sup>28</sup> where it is found on the standard of the nome together with the hieroglyph of the bull; it thus is used as part of the hieroglyphical complex, meaning "nome, region, district," ordinarily denoted by the hieroglyph of cultivated land irrigated by canals,  = *špt*. In the oldest Sumerian inscriptions there is a sign akin to the Egyptian hieroglyph , in the form of three triangles  meaning "mountains."<sup>29</sup> Thus in the oldest eastern systems of hieroglyphic writing the mountains were represented by a number of triangles, as in the designs on the ancient pottery.

The farmer lives on the earth and by the earth. He cultivates it, sows seeds and gathers the harvest. The earth nourishes him, and the whole cycle of his life is determined by the eternal round of the seasons and by his agricultural work. Therefore at the period of transition from primitive hunting to agriculture, the Egyptian painter naturally tended to represent both the scenery of the mountainous desert where he was still hunting and the landscape of the cultivated fields, in oases or valleys, where he was gradually accustoming himself to agriculture. But agriculture in those regions is not possible without artificial irrigation, and this may explain the great part that water began to play in his pictures. A new element, then, made its appearance in painting, viz., the "cultivation," which took its place, together with the representations of mountainous land and desert, in reliefs and designs in ornament and pictorial hieroglyphic writing.

One of the most interesting monuments of the archaic period, the mace-head of Hierakonpolis (now in the Ashmolean Museum, Oxford), represents the ceremony of the beginning of agricultural works. The king, wearing the high crown of Upper Egypt, holds in his hands the oldest agricultural tool, the hoe, and is evidently about to draw the first furrow. Behind him stand servants with high fans and in front of him a small man, bowing low, holds in his hands a basket from which he is going to sow the seeds in the furrow. The scene is laid on the bank of a canal, whose water is represented by undulating lines. This scene is of great historical interest, for it is one of the oldest representations of the "water landscape" in Egyptian art. Later on the representation of water by wavy lines became the standard method in Egyptian art.<sup>30</sup> Another landscape, perhaps still more archaic and not less characteristic, is painted on an ancient pottery vessel; it represents large boats, possibly funeral barks, with a background of mountains represented by triangles, and canal or river water again indicated by a number of undulating lines. The whole of this landscape is animated by figures of beasts, of ostriches, and people, which fill up the empty spaces between the mountains, the water and boats.<sup>31</sup>

The repetition of wavy lines to give the impression of rippling water or waves led to the gradual transformation of the picture of water into a wavy ornament. An interesting vessel in the Berlin Museum, No. 20304, published by Scharff, bears a picture of a boat, mountains, and water, but the mountains and the water are here represented by purely ornamental lines.<sup>32</sup> The water is represented in the same manner, viz., by wavy lines among the zig-zags of the mountains and rare figures of trees and birds on two vessels, Nos. 11564 and 11565, in the Cairo Museum, published by Quibell.<sup>33</sup> And on an archaic pottery vessel in the Moscow Museum of Fine Arts there is a purely ornamental form of undulating lines, evidently based upon those representing water (fig. 9).







The use of wavy lines to represent water became so enrooted in Egyptian art that it was preserved in its rigid archaic form up to the Hellenistic epoch.















FIG. 9.—EGYPTIAN POTTERY JAR.  
(MOSCOW MUSEUM OF FINE ARTS.)


When representing a rural scene, of cattle following the ox-herd through a canal, a painter of the Old Kingdom rendered the water by a row of vertical wavy lines.<sup>34</sup> Two thousand years later, in a picture of ploughing and harvesting on the wall of the tomb of Sn-ndm (New Kingdom), the painter represented the water of a canal by undulating lines. In the scenes of fishing which are so often met with in Egyptian tombs, especially of the New Kingdom, the archaic method of representation still obtains; monotonous undulating lines fill up the area of canal or river.<sup>36</sup> The boat may rest on the edge of this area, as in the scene of fishing on the tomb of Menena,<sup>37</sup> or the whole background may be covered with wavy lines<sup>38</sup>; but the principle of the schematic representation of water by wavy lines remains the same. This archaic and immutable method of indicating water is found in every scene connected with it; in representations of boats navigating on rivers and canals, of ships transporting cargoes, or people fishing, of ponds and water tanks in gardens, pools bordered with trees or supplying water for making bricks,<sup>40</sup> a man praying before a palm tree and water,<sup>41</sup> and even water running from a jug-neck, the Egyptian painter always represented the water by undulating lines which form a kind of undulating ornament. Thus was effaced the line between design and picture, for the semantics of the representation remained in both cases the same.

The Egyptian hieroglyphic writing which originated in the picture, and which frequently acquired strictly ornamental forms, indicates conspicuously the inner relationship between design, picture and hieroglyph in a plain wavy line as hieroglyph.

The hieroglyph  which does duty for the alphabetic sign "n" goes back in its pictorial form to the representation of an undulating surface of water. This sign is found in the inscriptions of the first dynasties and enters into the name of the Pharaoh Den .<sup>43</sup> As a phonetic sign, it forms part of old words meaning water:  = *nw*, "primordial water," and  = *nw*, "stream of water." The same sign forms an important part of the word  = *nt*, "water,"<sup>44</sup> the notion of water being here determined by three wavy lines, viz., by the trebling of the hieroglyph, which is the oldest form of denoting collective names and plurals. In the word  = *mw*, also, "water" is denoted by three wavy lines, to which corresponds the phoneme "mw" conserved in the Coptic **MOOY**. Thus the phoneme of the word "water" is intimately connected with the semantic base of the pictorial hieroglyph of three wavy lines. And the most interesting feature is the simultaneous presences therein of two numbers, the singular and the plural, as it denotes "waters, liquid, sperm, son, water."<sup>45</sup> Purely ornamental forms of this hieroglyph are seen in the inscriptions in the tomb of Ptahhetep, in the tombs of Beni-Hasan, and in the texts of Deir-el-Bahri.<sup>46</sup>

This hieroglyph of water is intimately connected with another sign representing the canal . This latter hieroglyph usually has the form of a rectangle, filled with vertical zigzag lines and painted blue to give the idea of a space filled with water. The upper and the lower rectangular borders, also painted blue, represent the shores of the canal.\* In its simplified schematic form this hieroglyph occurs in the inscriptions of the archaic epoch,<sup>47</sup> and particularly in the title of an official, , which may be translated as "local superintendent," and Brugsch translates as "superintendent of canals." It is quite natural that by this epoch, when the irrigation network was of great importance in the economic life of the country and was the charge of the whole community, district or central authority, the local officials or nomarchs had to direct a great deal of their activity to its maintenance. Sir Flinders Petrie, one of the greatest authorities on the history of ancient Egypt, counts fifteen mentions of this ancient official title in the royal tombs of the first dynasties.<sup>48</sup>

This same hieroglyph is an ideogram in the word  = *mr*, "canal," and determines the notions, "river, lake, sea," for example,  = *w<sup>3</sup>d-wr*, "sea," literally, "the great green," and  = *h<sup>3</sup>pj*, "Nile." From the period of the Old Kingdom it is very often met with in the complex determinative meaning, "river, sea, lake,"  = *itrw*, "river," or  = *hnw*, "brook, spring." A variant of this hieroglyphic sign, a somewhat curved form, also represents the irrigation canal,  [cf. the Sumerian sign  = e-(g)=canal†]. The hieroglyph , representing a rectangular basin or pool, very conspicuously conserved its original pictorial form, filled in, as it is, with wavy lines. This hieroglyph forms the word  = *š*, "lake, pool, basin," as well as forming part of the word , "irrigated land," which


\* Davies, *Ptahhetep*, vol. I, pl. XI, no. 218. Cf. the Sumerian sign  = water-basin; Langdon, *Sumerian Grammar*, p. 292.

† Langdon, *Sumerian Grammar*, p. 267.

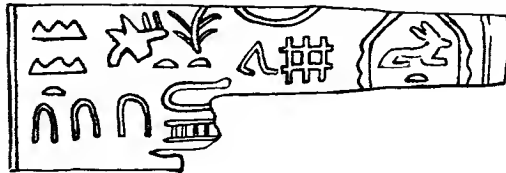




in a somewhat modified phoneme sounds as *st<sup>3</sup>t*, "irrigated soil," or, metaphorically, "unit of earth measurement—arura".<sup>49</sup> The hieroglyph "water" is here closely connected with the sememe, "irrigated land," which is proof of the close amalgamation of the signs, and accordingly of the notions, "water" and "earth," thereby emphasizing the importance of artificial irrigation in the agriculture of ancient Egypt.

Identical hieroglyphic signs denoting water are found in other systems of pictorial writing. Such is the old Sumerian sign  $\simeq$  = mu, which is the simplified form of two undulating lines, and also the Sumerian sign  = lum, "brook," which goes back to three undulating lines and is met with in a number of variants.<sup>50</sup> Such also is the Chinese sign for "river," the stream of water collected from many tributaries. It is of interest to observe that the Chinese script, in addition to the sign  $\lll$   $\lll$ , composed of three wavy lines, also has signs made up of two wavy lines,  $\gg$   $\gg$ , "water stream, river," and even a single line denoting "little brook." There are, moreover, compound hieroglyphs:  $\lll$ , "river barred by a dam, disaster," and  $\lll$   $\oplus$ , "uncultivated lands, wasted by a flood". In all these signs, Egyptian, Sumerian, and Chinese, water is represented by wavy lines.<sup>51</sup>

But if the hieroglyphic signs connected with the notions of water and earth are so closely related by their pictorial form as well as by their meaning, an analogous connection may have existed between the oldest forms of the corresponding ornament and the picture connected with it. In fact, we find on many pottery vessels of ancient Egypt original ornaments of exactly this character.<sup>52</sup> These ornaments consist sometimes of triangles, filled with parallel or intersecting straight lines (figs. 5-7), and sometimes of squares and rectangles covered inside with a chessboard-like net. These designs enter into large landscape compositions, as on the Moscow dish (fig. 8), where the hatched triangles represent a mountainous land in which a man is hunting; whereas on the Berlin vessels, Nos. 19334 and 21098, from Abusir-el-Meleq,<sup>53</sup> rectangles with chessboard designs alternate with representations of beasts and mountains—proof that we have here not a monotonous design, but an attempt by the painter to represent the forms of nature surrounding him, and the ground intersected by a network of canals or divided into separate fields. This latter suggestion is confirmed by the comparison of the chessboard and the semi-chessboard ornaments with analogous hieroglyphs going back to the remotest epochs of Egyptian history, for instance, the very interesting hieroglyph  $\text{||||}$ , "region, district, nome". This sign is met with in a number of inscriptions of the archaic epoch,<sup>54</sup> and particularly on a tablet of ebony, where an interesting historical inscription runs as follows:



"There goes the lord, the king of Upper and Lower Egypt, Semti, who took possession of thirty regions."<sup>55</sup>

We find it also denoting the word "nome" on a number of other objects from the same period,<sup>56</sup> its form usually being a rectangle filled with parallel vertical lines which may represent irrigation canals,  $\text{||||}$ , "lake, canal." Examples of this hieroglyph are found back to the period of the Old Kingdom, notably

in the tomb of Ptahhetep, where the word "nome" occurs in this form. But the classical form of this hieroglyph is that which approaches nearest to the chess-board ornament, the rectangle divided into a number of small rectangles by five or six vertical lines and a horizontal one. We find this hieroglyph in the Pyramid Texts (Pyr. 126), but it is met with in its most distinctive form in the beautiful inscriptions of the Middle Kingdom at El-Bersheh and Beni-Hasan, in the names of various *nomes*. Usually this hieroglyph plays the part of ideogram or determinative in the word  $\begin{smallmatrix} \square \\ \text{---} \\ \text{---} \\ \text{---} \\ \text{---} \\ \text{---} \end{smallmatrix}$  var.  $\begin{smallmatrix} \square \\ \text{---} \\ \text{---} \\ \text{---} \\ \text{---} \\ \text{---} \end{smallmatrix}$  = *šp-t*, "district, region, nome". The names of the *nomes*, which include sacred *totem*-standards, are very often connected with these pictorial signs of land divided up by canals or into fields.

An analogous pictorial hieroglyph denoting a field divided into separate parts by irrigation canals  $\begin{smallmatrix} \square \\ \text{---} \\ \square \\ \text{---} \\ \square \end{smallmatrix}$  is found in the oldest Sumerian inscriptions, notably on the Blau monuments (Brit. Mus., No. 86261, 1), and in a somewhat complicated form in the inscriptions from Fara.<sup>58</sup> It is probable that the old Chinese hieroglyph  $\begin{smallmatrix} \square \\ \text{---} \\ \square \end{smallmatrix}$ , "field, village," goes back to the same fundamental picture.

Thus the study of the geometric designs on ancient pottery vessels, and comparison of them with the analogous pictures and the pictorial hieroglyphic signs of the various archaic scripts, shows that the painter of those days tried to represent schematically in these ornaments the forms of nature and the landscapes (mountains, cultivated land divided into separate parts by irrigation canals, and water) which surrounded him and exercised a strong influence on his consciousness and genius.

V. I. AVDIEF.

(Museum of Fine Arts, Moscow.)

- <sup>1</sup> Cesnola, *Cyperm*, Vol. 2, taf. 39, 42, 45; Vol. 1, pls. 5, 13.  
Perrot et Chipiez, *Cypre*, p. 689, fig. 493; p. 695.
- <sup>2</sup> Evans, *Palace of Minos*, Vol. 1, p. 63, fig. 27; p. 74, fig. 42; p. 113, fig. 80.
- <sup>3</sup> Fimmen, *Kretisch-Mikenische Kultur*, ss. 132-3, Abt. 128.  
Bogaevski, *Krit i Miken* (*Crete and Mycenae*), fig. 53. (In Russian.)
- <sup>4</sup> Pézard et Pottier, *Catalogue des antiquités de la Susiane au Musée du Louvre*, Paris, 1926, pls. 82-9.
- <sup>5</sup> E. F. Schmidt, *Tepe Hissar Excavations*, 1931, in *Museum Journal*, Vol. 23, no. 4, pls. 82-9, Philadelphia, 1933.
- <sup>6</sup> De Morgan, *Mission . . . en Perse*, Vol. 4, pp. 109, 116, 117.
- <sup>7</sup> Pumpelly, *Expedition in Turkestan*, Vol. 1, p. 133, nos. 106-13.  
King, *History of Sumer and Akkad*, p. 356, fig. 69.  
Kobranov, *Anau*, 1927, pls. 13-14, 36. (In Russian.)
- <sup>8</sup> The pottery found there is in the Moscow Museum of Anthropology, nos. 62-N, 62-31, 62-34, 62-35.
- <sup>9</sup> Gordon Childe, "Notes on some Indian and East Iranian Pottery," *Ancient Egypt and the East*, 1933, Parts 1, 2, pp. 15-25.
- <sup>10</sup> Flinders Petrie, *Abydos*, Vol. 1, pls. 1, 2.
- <sup>11</sup> Capart, *Les débuts de l'art en Egypte*, pp. 115, 114, 106.  
A. Scharff, *Grundzuege zur aegyptischen Vorgeschichte*, taf. 6, f.  
V. Avdiev, *Proizvodstva i chudozhestvenie remiosla v drevnem Egipte* (*Industry and Artistic Crafts in Ancient Egypt*), Moscow, 1930, p. 11. (In Russian.)
- <sup>12</sup> Scharff-Moeller, *Die archeologischen Ergebnisse . . . von Abusir-el-Meleq*, 1926, taf. 12, no. 49; Quibell, *Archaic Objects*, Vol. 2, pl. 21.

- <sup>13</sup> V. Avdiev, op. cit., p. II.
- <sup>14</sup> Scharff-Moeller, op. cit., S. 21, no. 32.
- <sup>15</sup> W. Wreszinski, *Atlas*, Band I, taf. 215.
- <sup>16</sup> Scharff-Moeller, op. cit., S. 21, no. 33; taf. 5-c; Scharff, op. cit., taf. 5-c; Quibell, op. cit., Vol. 2, pl. 23; Capart, op. cit., pp. 110-113.
- <sup>17</sup> A. Gardiner, *Egyptian Grammar*, p. 59.
- <sup>18</sup> Hilda Petrie, *Egyptian Hieroglyphs of the First and Second Dynasties*, pl. 22, nos. 505-9. This excellent selection of Egyptian archaic hieroglyphs is very useful for the study of the hieroglyphic writing of the archaic epoch.
- <sup>19</sup> Flinders Petrie, *Royal Tombs*, Vol. 2, pl. 38.
- <sup>20</sup> W. Wreszinski, *Atlas*, Band I, taf. 215.
- <sup>21</sup> Davies, *Ptahhetep*, Vol. I, pl. II, no. 217.
- <sup>22</sup> Blackman, *Meir*, Vol. II, 17, nos. 36-7.
- <sup>23</sup> Hilda Petrie, *Egyptian Hieroglyphs*, pl. 21, nos. 501-4.
- <sup>24</sup> Davies, *Ptahhetep*, Vol. I, pl. II, no. 210.
- <sup>25</sup> Jensen, *Geschichte der Schrift*, S. 62.
- <sup>26</sup> Evans, *Palace of Minos*, Vol. I, fig. 214, no. 114.
- <sup>27</sup> Davies, *Ptahhetep*, Vol. I, pl. II, no. 210.
- <sup>28</sup> Pyr., 1013.
- <sup>29</sup> Deimel, *Liste der archaischen Keilschriftzeichen von Fara*, S. 48, no. 461.
- <sup>30</sup> Capart, op. cit., p. 243.
- <sup>31</sup> Ibid., p. 118.
- <sup>32</sup> A. Scharff, op. cit., taf. 5, c.
- <sup>33</sup> Quibell, op. cit., Vol. 2, pls. 21-3.
- <sup>34</sup> H. Schaefer, *Von Aegyptischer Kunst*, Auflage 2, taf. 16, 1.
- <sup>35</sup> W. Wreszinski, *Atlas*, Band I, taf. 19. <sup>36</sup> Ibid., taf. 2, 250, 364. <sup>37</sup> Ibid., taf. 2. <sup>38</sup> Ibid., taf. 364. <sup>39</sup> Ibid., taf. 42, 308, 387, 410. <sup>40</sup> Ibid., taf. 3, 66, 92, 222, 319. <sup>41</sup> Ibid., taf. 111.
- <sup>42</sup> Schaefer, *Von Aegyptischer Kunst*, Leipzig, 1922, taf. 43, 2.
- <sup>43</sup> Flinders Petrie, *Royal Tombs*, Vol. 2, pl. 7.
- <sup>44</sup> Sethe, *Alphabet*, 153.
- <sup>45</sup> Erman-Grapow, *Aegyptisches Handwoerterbuch*, S. 63.
- <sup>46</sup> Davies, *Ptahhetep*, Vol. I, pl. II, no. 211; Griffith, *Hieroglyphs*, pl. II, 176.
- <sup>47</sup> Hilda Petrie, *Egyptian Hieroglyphs*, pl. 22, 512; pl. 23, 529-31, 542-8.
- <sup>48</sup> Flinders Petrie, *Royal Tombs*, Vol. 2, p. 53, nos. 24, 49, 56, 64-7, 84, 149, 153, 154, 158, 161, 163, 178.
- <sup>49</sup> *Urkunden des aegyptischen Altertums*, Band. 4, 173, 1.
- <sup>50</sup> Langdon, *Sumerian Grammar*, 1911, p. 261; Deimel, op. cit., S. 22, no. 194.
- <sup>51</sup> L. Wieger, *Caractères chinois, Etymologie, Graphies, Lexiques*, Moscow, 1931, pp. 22-5. (Russian translation by Itigin.)
- <sup>52</sup> Capart, op. cit., 110, 117; Quibell, op. cit., Vol. 2, pl. 21, nos. 11551, 11535; Scharff-Moeller, op. cit., taf. 12, no. 47; S. 21, no. 33.
- <sup>53</sup> Ibid., S. 21, no. 33.
- <sup>54</sup> Flinders Petrie, *Royal Tombs*, Vol. I, p. 28, no. 37.  
Hilda Petrie, op. cit., pl. 22, no. 511.
- <sup>55</sup> Flinders Petrie, *Royal Tombs*, Vol. I, p. XV, 18.
- <sup>56</sup> Ibid., Vol. 2, pl. 5, no. 12.
- <sup>57</sup> Davies, *Ptahhetep*, Vol. I, pl. II, no. 206.
- <sup>58</sup> Deimel, op. cit., S. 12; Langdon, *Sumerian Grammar*, p. 269.
- <sup>59</sup> L. Wieger, op. cit., p. 526.

# A PANTHEISTIC REPRESENTATION OF AMON IN THE PETRIE COLLECTION.

THE little figure of an Egyptian God published here (fig. 1a, 1b) belongs to the Petrie Collection at University College, London. It is 5.3 cm. high and covered with a light green paste, and it represents a dwarfish figure with crooked legs, whose feet are broken off. The head is that of a ram with a wig, and is turned backwards. Although other collections, for instance, the Louvre and the Musée Egyptien de Marseille<sup>1</sup>, possess similar representations, no object of this kind has, to my knowledge, ever been published or discussed. The figure belongs to the type of the so-called pantheistic deities which are frequently met with at a later period of Egyptian civilisation. The body resembles that of Ptah-Petek,<sup>2</sup> while the head is that of the god Amon Arietinus described by Herodotus :

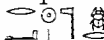
<sup>1</sup> Ἀπὸ τούτου κριοπρόσωπον τοῦ Διὸς τῷ γαλμα ποιῶσι Αἰγύπτιοι. . . . Ἀμοῦν γὰρ Αἰγύπτιοι καλέουσι τὸν Δία. <sup>3</sup> "From this the Egyptians make their statues of Jupiter ram-faced . . . for the Egyptians call Jupiter Amon."

The Petek figures are themselves combined types of the God Ptah and of Horus Harpocrates, described in the Chester Beatty Papyrus and by Plutarch as "feeble in his limbs."<sup>4</sup> These figures are identical in meaning with the





FIG. 1a.

FIG. 1b.

representation in Crypt No. 9 of the Temple of Denderah, where the young sun appears under the aspect of a child with crooked legs accompanied by an inscription above him:  999, "The sun who becomes flesh".<sup>5</sup>

Gods or demons facing backwards exist from the earliest times on in religious conception of the Egyptians. Thus, the celestial ferryman in the Pyramid texts is called "The One who looks behind", or "His face is behind him".<sup>6</sup> A god facing backward acts as one of the judges in the 125th chapter of the Book of the Dead. In domestic magic male or female demons, called "The one whose nose is turned backward, and whose face is turned away",<sup>7</sup> personified sickness, and might be conjured and expelled by means of a preparation of honey.<sup>8</sup>

The figure in the Petrie collection is, however, not one of these semi-gods or demons; it is in all probability a representation of the Sun-god, a kind of illustration to a theological speculation. Similar representations appear in the Book of the Dead of the Saïte epoch, as in a vignette of Chapter 164 which shows a dwarf with two heads, in the posture of Min and with the head-dress of Amon.<sup>9</sup> The Louvre possesses a little bronze figure of a god with two heads, the one looking backwards being that of a ram. The two aspects of the Sun-god—the Day-sun and the Night-sun—are illustrated by a painting in the tomb of Queen Nefert-ari. Two goddesses, Isis and Nephthys, adore a mummy-shaped figure with the head of a ram, with the horns of Khnum, called Râ. On one side is the inscription, "This is Râ who rests () in Osiris"; on the other, "Osiris who rests () in Râ." It is evident that the whole illustrates some religious speculation of the Egyptian priests.<sup>10</sup>

A similar speculation found its expression in the figure in the Petrie Collection. The two directions—that of the body and that of the head looking backwards—may be explained by a passage from the Book of the Dead which was applied to the Sun-god and described his everlastingness: "I am yesterday and to-morrow, Horus who is born a second time".<sup>11</sup>

As we have here a combined figure of three gods—the head being that of Amon, the body a compound of Ptah and of Horus the child—a passage from the Leiden papyrus fully expresses the idea, substituting only Râ for Horus: "Three are all gods, Amon, Re, and Ptah; there is none like them, concealing (imn) his name as Amon. To him belongs Re as face; his body is Ptah".<sup>12</sup> The last sentence may explain why the head is turned backwards: it is to indicate the "deus invisibilis," the god who, according to another passage of the same hymn, is thus described: "One is Amon, concealing (imn) himself from them (i.e., humanity); hiding himself from the gods. His aspect is not known."<sup>13</sup>

A. PIANKOFF.

<sup>1</sup> LOUVRE E. 5712; G. MASPERO, *Catalogue du Musée Egyptien de Marseille*, Paris, 1889, p. 154, no. 779.

<sup>2</sup> A. ERMAN, *Aegyptische Religion*, 1934, p. 148.

<sup>3</sup> HERODOTUS, II, 42; *A.Z.*, 1877, pp. 11 ff.; *A.Z.* 54, pl. II, p. 76.

<sup>4</sup> A. GARDINER, *Chester Beatty Papyrus*, Part I, p. 16.

<sup>5</sup> ÉTIENNE DRIOTON, "Un Oudja à représentation hermopolitaine" in *Revue d'Égyptologie*, Tome I, Fasc. 1-2, pp. 81 ff.

<sup>6</sup> Pyramid Texts, edited by K. SETHE, §§ 517, 999, 1091, 1201, 1227, 1441; §§ 383, 597, 599, 925, 1225, 1227 and 1769.

<sup>7</sup> A. ERMAN, *Zaubersprüche für Mutter und Kind*, Berlin, 1901, pp. 11 ff.

<sup>8</sup> Cf. the punishment inflicted by Dante on those who had practised magic and the arts of divination :

“ . . . che da le reni era tornato il volto,  
ed in dietro venir li convenia,  
perchè 'l veder dinanzi era lor tolto.”

(*Inferno*, Canto XX.)

<sup>9</sup> LEPSIUS, *Das Todtenbuch der Aegypter*, pl. LXXVIII.

<sup>10</sup> G. FOUCART, *La belle fête de la vallée*, pl. XXIII (*Bulletin de l'Institut français d'archéologie orientale*, t. XXIV, 2<sup>e</sup> fascicule).

<sup>11</sup> Chapter LXIV, cf. *Rec. de trav.*, 37, p. 7.



FIG. 2a.



FIG. 2b.

<sup>12</sup> A. GARDINER in *Ä.Z.*, 42, p. 35, and K. SETHE, *Amun und die acht Urgötter von Hermopolis*, and 179 ff. Cf. the pantheistic representation of a divinity (figs. 2a, 2b) which combines, under the head of a ram of Amon the body of Ptah Petek and the body of the Hawk of Horus. See : DARESSY, *Catalogue Général*, Caïre, *Statues de Divinités*, no. 38829.

<sup>13</sup> *Ä.Z.*, 42, p. 34. Cf. MORET, “Le rituel du culte divin journalier en Egypte”, *Annales du Musée Guimet*, XIV, p. 134.

## CHANGES IN THE EGYPTIAN COAST.

THE rarity of earth movements in Northern Europe has hindered us from realising how frequent such changes have been in Mediterranean lands. In Britain the last great change was during the age of the Hyksos in Egypt ; then the land sank 80 ft. between 3000 and 1500 B.C.<sup>1</sup> In the Mediterranean, however, there is a serious earthquake about every two years, and many areas have changed in level since Roman times.

Changes of level have ulterior effects, which are as much indirect as direct. When the land sinks it is inundated, as in Norfolk or the Delta of Egypt ; long estuaries are formed in valleys, which are gradually silted up during some thousands of years. The sea is continually rising against a firm shore, and no sands are exposed round most of the tideless Mediterranean. But when the land rises there is always a sandy level exposed, and on the Palestine coast that is swept over by the usual westerly gales, which carry the sand inland.

The Delta of Egypt and neighbouring coasts have suffered the usual fate of deltas. The Rhone Delta has sunk 40 ft. in 3000 years.<sup>2</sup> The Nile Delta, similarly, loaded with a hundred feet of deposits, has sunk 40 ft. at Alexandria, and even more to the eastward.

The great new capital called the " Dwelling of Rameses," in the north-east of the Delta, was celebrated for its delightful situation.<sup>3</sup> If this were at Pelusium it is now in a swampy desolation, reached by deep wading in mud ; if it were at Tanis it is now on salt marshes, without any cultivation within ten miles. Similarly, the original allotment of land into nomes extended down to the coast where now there is a region of swamps and lakes.

The same story is found when excavations are attempted. Whether at Alexandria on the west, at Buto in the mid-Delta, or at Nebesheh on the east, the Ptolemaic level, or the XXVIth dynasty, is the present water level.

With these preliminaries about the Delta, we can better understand the conditions of the neighbouring coast land stretching northward into Palestine. The earth movements there have been both violent, in earthquakes, and gradual, in changes of level.

In 30 B.C. a great earthquake desolated Judaea, large numbers of cattle were killed, and 10,000 men lost their lives.<sup>4</sup>

About A.D. 20 Strabo stated, " During my stay at Alexandria the sea rose so high near Palestine and Mount Kasios as to overflow the land ; so that the journey from Kasios into Palestine might have been undertaken by water." <sup>5</sup> He describes an earthquake which accompanied this irruption, thus : " At Mount Kasios in Egypt the ground to a considerable distance, after a violent and single shock fell in parts, at once exchanging places ; the elevated parts opposed the access of the sea, and parts which had subsided admitted it. Another shock occurred, and the place recovered its ancient positions, except that there was an alteration in some places and none in others." <sup>6</sup>

A description of an earthquake wave at Crete is given by Philostratus in A.D. 45 : " A violent concussion of the earth shook the whole island, followed by a rumbling sound proceeding from the ground ; in consequence of which

the sea withdrew about 7 stadia (furlongs) from the shore, . . . on the same day and hour in which the earthquake was felt, an island rose out of the sea between Thera and Crete." <sup>7</sup>

In A.D. 68 a further sinking of the land is recorded as a prodigy before the death of Nero, "the Egyptian sea overflowed the coasts."<sup>8</sup>

Of the great earthquake at the close of A.D. 114 there is an account by Dion Cassius; it was at a time when the expedition of Trajan to Parthia, and business related to that, had crowded the city of Antioch. "At first there was heard a kind of bellowing noise, then the earth heaved up, and the houses shook. There was a dreadful noise of the crashing of stones, bricks, and tiles which were rent from their places. The air was filled so thick with dust that people could not see each other. Several persons were raised in the air, and turned out of their houses. Some were crippled, others killed. The violence of the shock was so extreme that trees were torn up by the roots. . . . As it continued for several days and nights, nobody knew what remedy to apply to it. . . . Mount Corasus shook to that degree that it perfectly bowed, and seemed just ready to fall upon the city. There were other mountains also that bowed their heads. Water appeared in places where none had ever been seen, and other places were dry that had always received water."<sup>9</sup>

Evidences of large changes of level may be seen in the Wady Ghazze. At 130 ft. above sea level the valley is filled with silt, having a flat surface level from side to side, and for some miles up the valley from Tell Jemmeh (Gerar). Such a level surface, from which sloping valley sides rise up, could not possibly be due to wind action; nothing but deposit under water could produce such a surface. I searched two or three miles downstream to see if the valley had been dammed or obstructed, but there was no break in its steady widening. I found, however, similar silting not quite so high at Um Gerar, two miles downstream, with masses of Roman pottery thrown in it, and some pottery at the bottom of the deposits. I also found Roman glass 12 feet down in the silt at Tell Jemmeh.

The only possible conclusion seems to be that the sea level had been up to 130 ft. in Roman times. Confirmation of this appears at the coast near Khan Yunis, where hills rising about 80 feet above the sea are thickly covered with quite fresh shells, not weathered or sand worn. Moreover, the country is dotted with *khurbehs*, ruins of villages, of about the period of Justinian, but none of them are below the 130 ft. level. As the lower positions are the better irrigated, it seems impossible to suppose that the best position would be avoided. The material evidence then is for a depression of 130 ft. at about the fourth or fifth century, followed by a rise at a later period. The depression is not likely to have taken place before that time, as at Anthedon the Hellenistic and Roman towns are at a low level with few coins in the district later than A.D. 400 in date.

In Lake Menzaleh there are scattered the sites of dozens of towns and villages, now submerged. Tennes was a considerable city in A.D. 440; by 535 the land was partly submerged. The main flooding of Menzaleh took place in A.D. 554. By 1193 the last inhabitants had removed to Damietta. All this points to a subsidence beginning in the Roman period and culminating about A.D. 1200. Probably the course of this change of level was emphasised by the great earthquakes on this coast which are recorded in A.D. 934, 954, 1033, over all Syria in A.D. 1202, and in 1303.<sup>10</sup>

It is often supposed that submersion must leave some permanent mark or change on the land, yet at Pozzuoli who would credit that there had been



a great submergence, were it not for the Pholas borings in temple columns, which supplied the standard case used by Lyell in his evidence of changes of levels? Only where a low level has long been exposed to waves can we expect to find obvious beach levels, and in any country with wild vegetation the traces of submergence are easily invisible.

Turn now to the west of the Delta. Excavations were made by Hogarth on clear land in Alexandria, but he could not reach the Greek city which lies below water level. In the sea there are visible large quays and walls which would have been in use when the land was 23 ft. higher. As the Ptolemaic city must have been about this height above sea level, it is clear that these quays are the works of such an age. The romance that they date from prehistoric Greek times is baseless.

The tombs along the coast to Meks have their floors awash with the present sea, so must have been cut when at a higher level.

Though there has been a great depression of the land, it is now rising again. On the shore at Alexandria I was surprised to see a stack of water-laid débris and pottery, which rises to 18 feet above sea level with loose stuff over it up to 23 feet. So the total depression has been 23 feet by the quays and, say, 20 feet at the stack, or 43 feet, of which nearly half the amount has now been recovered.

With these evidences of changes of level before us we can interpret the invasion of the coast by sand dunes. Down to the 1st century there would be few exposed sand beaches, and little chance of any serious amount of sand being wind-borne inland. This condition ceased about the 14th century, when the land began to rise, exposing sand beaches which could be blown inland. This lifting of sand from the sea seems by now to have diminished, as there is a wide flat shore for a quarter of a mile inland at Anthedon, and the action of the wind is mainly spent in pushing forward the dune masses, over 50 ft. high and 2 or 3 miles wide, across the country.

FLINDERS PETRIE.

<sup>1</sup> Clement Reid, *Submerged Forests*, pp. 114, 120. Roman level at the Thames, 16 ft. down: *Nature*, 23 Aug., 1930. Cardigan Bay flooded A.D. 430: see 37th triad, Probert, *Ancient Land of Cambria*.

<sup>2</sup> *Nature*, 1930, p. 604.

<sup>3</sup> Erman, *Egyptian Literature*, pp. 206-7.

<sup>4</sup> Josephus, *Antiquities*, XV, v, 2.

<sup>5</sup> Strabo I, ii, 16.

<sup>6</sup> Strabo XVI, ii, 26; perhaps part of the great earthquake of A.D. 17 when twelve cities of Asia were wrecked.

<sup>7</sup> *Life of Apollonius*, xxxiv. (Pliny confused the consulates of A.D. 3 and 46.)

<sup>8</sup> Dion Cassius in *Nero*.

<sup>9</sup> Dion Cassius in *Trajan*.

<sup>10</sup> Poole, *Student's History*, pp. 81, 88, 216, 301.

## THE PULL-SAW IN EGYPT.

THE earliest existing model of an Egyptian saw dates from the IIIrd dynasty (Petrie, *Tools and Weapons*, pl. XLVIII), but there remains from the Ist dynasty a fragment of a wooden sarcophagus clearly showing the marks of a saw. The lack of regularity in the direction of these marks suggests that the proper form and use of the tool was not known at that time. The earliest saws must have had the teeth just roughly notched out with no particular regard for the uniform direction of the cutting edge. They could not therefore be termed "true" saws, *i.e.*, that type which has the straight, or cutting, edge of the teeth arranged in one particular direction. In the Vth dynasty we begin to get evidence from the tomb paintings of the existence of the true saw.

Lately, however, an important find has been made in the Indus valley (E. Mackay, *The Indus Civilisation*, p. 126). It is the remains of a 16½ inch bronze saw dating to c. 2500 B.C. The teeth are only roughly notched out, but the interest lies in the "set" of the teeth, which are undulated. In modern saws the only type which has undulated teeth is the hack saw, which is used solely for cutting metal. The ordinary wood-cutting saw has each tooth set separately in order to prevent binding, but this method while perfectly adequate for dealing with wood is useless where metal is concerned; only the undulated type will cut metal without binding. It is, then, possible that the Indus Valley people were aware of this fact, and that the specimen found at Mohenjo-daro is a metal-cutting saw. If so, they must either have used this type of saw for cutting both wood and metal, which is quite possible, or have had some other kind of saw for wood. In any case this type of saw is unique at so early a period; no specimen of an undulated saw has come to light in Egypt or Sumer.

The Vth dynasty tomb-paintings give no hint of metal-sawing, but there is abundant evidence as to how the Egyptians sawed wood. An unusual feature in these scenes is that the carpenter has placed the block to be sawn in an upright position, instead of in the horizontal one common at the present day. Fig. 1 is typical; the block was tied firmly to a post fixed in the ground and then cut through in a downward direction. There were apparently two methods of tying the blocks:—

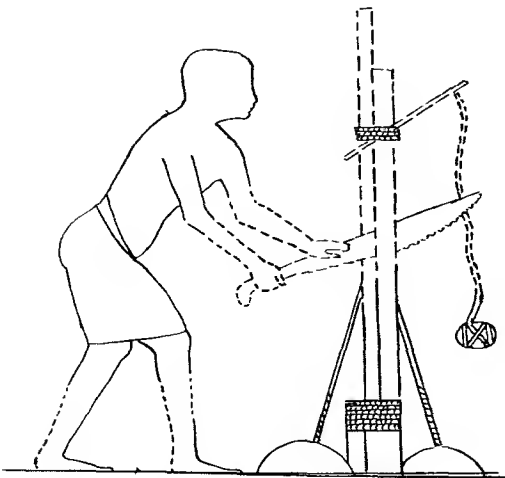


Fig: 1. DESHASHEH Plate XXI.

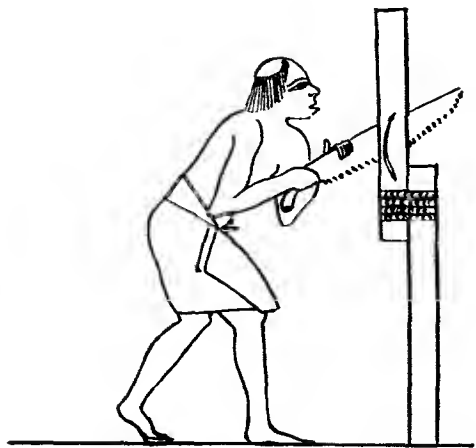


Fig: 2. TOMB of TWO SCULPTORS. Plate XL.

(a). This method would be possible only for very short blocks of soft wood. The plank was so tied that a small section extended above the post. When this was sawn through, the binding was removed, the block pushed further up and re-bound, after which the sawing continued.

By this method the carpenter usually had the block between himself and the post (fig. 2). For the last few inches, the binding would of course be retied above the saw, the block being placed at the side of the post, or the work would be finished on the ground.

(b). The second way, suitable for long or short planks, was to tie the block to the side of the post, so that there was no interference while sawing (fig. 3). When the saw had cut down to the upper binding, this was untied and replaced higher up, above the saw, which then continued its downward journey. In some scenes the lower binding shown in fig. 3 is lacking, and it appears to have been optional. It would, however, facilitate the work to have both an upper and a lower binding.

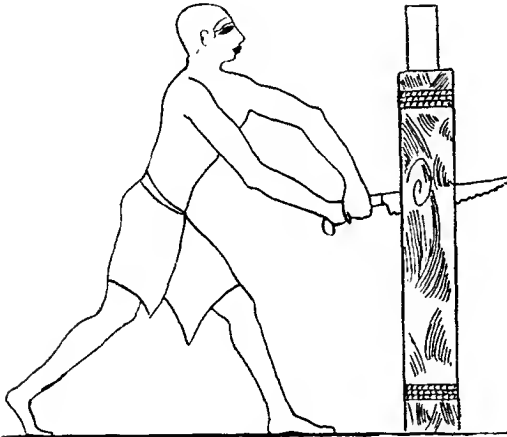


Fig: 3 REKHMARA Plate XVII.

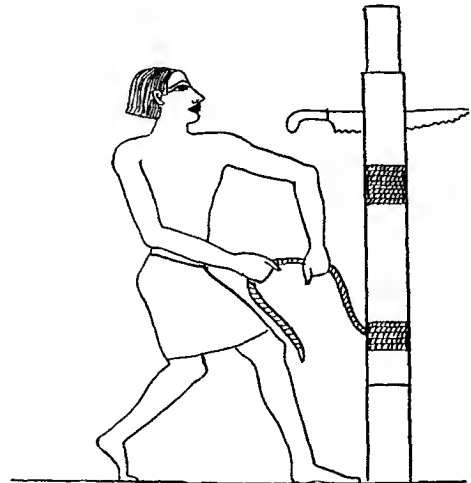


Fig: 4 REKHMARA Plate XVIII.

In fig. 4, a carpenter is evidently using the first method. He is untying the wood in order to push the block up. Had he adopted the second method, it would have been unnecessary at that stage to untie the lower binding. He is obviously intending to remove both bindings.

With either of these methods a weighted stick, passed between the rope and the post, was often used (fig. 1). This acted as a tourniquet and automatically counteracted any loosening of the binding due to the vibration of sawing.

At first sight it is difficult to see how the carpenter could operate his saw in the cut between the tightly bound sides. The artist gives no hint, but modern methods provide a solution. In sawing planks or boards of a fair length wedges are always necessary to prevent the cut wood from "pinching", *i.e.*, closing together behind the saw and gripping it immovably. In hand sawing wooden wedges are used, while a small steel tongue, known as a "riving tool", is fixed upright behind a circular saw to perform the same duty. In the method used by the Egyptians, the wedge was driven in and then held in position by the binding. One wedge would be sufficient unless the plank were very wide. As, however, the actual wedge was hidden by the binding, it could not appear in the

pictured scene. In *Beni Hassan I* (Newberry), pl. XIII, lowest register, the artist has tried to suggest the necessary gap, but again could not show the wedges.

Regarding the saw itself, so few examples from Egypt have survived, and those so fragmentary (Garstang, *Burial Customs*, fig. 66), that it is quite impossible to discover which of the two varieties of saw they were, *i.e.*, the "push-" or the "pull-" saw. The push-saw has the cutting edge of the teeth set away from the handle, and the main force is used in pushing the saw forward. It is the type generally used in Europe to-day. The pull-saw has the teeth set in the opposite direction and needs the main force to be applied in pulling. This type is rare in the western world, except in Greece, where it is universally used and has been from time immemorial. It is also commonly used in the Far East. But though the evidence of the object itself is lacking, the tomb scenes show which type the Egyptians must have used. A careful examination of these scenes brings out four points common to them all:

(1) The block to be sawn is always upright and never horizontal. In the tomb of Menkheper-ra-senb (N. de G. Davies, *Tomb of Menkheper-ra-senb*, pls. XI, XII) objects which it is suggested are ivory tusks are also placed upright while being sawn.

(2) The saw always has its tip pointing upwards.

(3) The cutting is often done almost at breast-level, the man standing well away from his work.

(4) Invariably both hands are on the saw, and the drawing of arms and shoulders usually suggests that the man is exerting his strength to pull the saw towards him. For instance, in fig. 3 the carpenter has obviously pushed the saw lightly through, and is about to use his full strength to pull it back. The position of the legs as well as of the arms shows this.

It is conceded in all craftsmanship that the most convenient position must evolve naturally out of experience in the use of a tool. This position having once been found is invariably adhered to unless the tool itself changes fundamentally. Thus in modern times anything to be sawn is always placed horizontally, whether the block is to be cut across or along its entire length. It is the most convenient position for the push-saw. The fact, then, that the Egyptian always placed his wood upright argues that he employed a tool somewhat different from the modern form.

Practical experiment shows that, while it is quite possible to saw through a piece of wood in either position with either type of saw, it is much easier to use a push-saw on a horizontal, and a pull-saw on a vertical, piece of wood. So from the consistently upright position of his wood it must be inferred that the Egyptian used a pull-saw. Experiment has also shown that, with the wood upright in sawing, the tip of a push-saw constantly tends to turn downwards, whereas when a pull-saw is used the tip as consistently points upwards.

Again, when cutting at breast- or even waist-level, practical experience has discovered that with the hands at these levels it is fairly easy to pull strongly, but less easy to push. It is also important to note that the man not only stands well back from his work, but usually also bends well forward (fig. 3). If he had to exert his main strength in a pushing movement, such a stance would be both tiring and unnecessary; but if he were pulling, then both the distance and the bent body would increase the preliminary force of the pull.

The position of the hands is interesting. Occasionally both hands are placed on the handle, but more often one hand is actually on the back of the blade itself. This would be of no service with a push-saw, but might possibly be of advantage in pulling. It is likely, however, that a pad of some sort in the palm of the hand was necessary, to give both grip and protection.

An interesting model of a carpenter at work, with the position of the hands clearly shown, is published by Firth and Gunn, *Teti Pyramid Cemeteries*, pl. 29. In this model the disproportionate length of the saw is also very noticeable. These long saws are sometimes shown in the tomb scenes (Newberry, *Beni Hassan I*, pl. XXIX). They may possibly have been more practical than the shorter saw for cutting through tough wood.

Although the final proof can only be obtained with the discovery of a complete saw, a consideration of all the foregoing points makes it clear that, even if in later times the Egyptians knew of the push-saw, they always preferred from early times to use the pull-saw.

MARGHARITA LANE.

#### NOTE ON INSCRIBED AMULETS IN EGYPT.

THE Egyptians in prehistoric times made models of objects as amulets, both for personal wear and to place in tombs. Engraved figures began to supplant these in the dynastic ages. Thus we find actual beetles buried, many in a jar, in prehistoric graves; and later, in the Ist dynasty, there was a model beetle in alabaster, hollowed out to encase the animal.

In the IIIrd dynasty scarab models began to appear, bearing kings' names on the base. The most conclusive are those of Sneferu, on which his name is written S-nefer-r-f (whether from grammatical construction, or from precedence of the human sign). This spelling is only known on contemporary sculpture, while, later, S-nefer-f-r was the regular form. The style of work of the Old Kingdom scarabs is unlike that of any later time, and is much finer in its details. The occasional late copies of early names are quite different in fabric. The subject has been confused by three kings of the XXVth dynasty age taking the names Men · ka · ra, Nefer · ka · ra, and Men · kheper · ra; their scarabs are quite independent of those of the earlier kings, and are in a different style.

The button amulets begin with little shapes bearing figures akin to those of the Libyan rock carvings, and are unknown before the late Vth or VIth dynasties. There was often—and perhaps always—a subject race in each age of Egypt, keeping up its own fashions, as, for instance, the typical Magdalenian long flakes which were contemporary with the finest ripple flaking of flint knives. The lower race kept up its style on amulets in the Old Kingdom, and this rose to the surface and became prominent in the democratic outbreak at the decadence of the VIth dynasty, and under the Caucasian-Syrian kings of the VIIth and VIIIth. Such is the history of stamp or button amulets, so far as the facts are yet known. But the presence in Egypt of types of buttons exactly like some of North Syria and Babylonia shows that the Syrian invasion of the VIIth dynasty brought in northern designs for buttons, though the button may have originated in Egypt independently. I fear that deducing the scarab from the later button will confuse the historical evidence.

FLINDERS PETRIE.

[See Hornblower, *A Temple Seal and Its Connections*; ANCIENT EGYPT AND THE EAST, Dec., 1934.—ED.]

## REVIEWS

*The Treasure of Lahun.* By H. E. WINLOCK. Pp. 80, 16 pls. 1934. (Metropolitan Museum of Art, New York.) \$6.00.

This is a detailed study of the great find of jewellery from Lahun, now in the Metropolitan Museum of New York. The original account of the excavation and of the objects was published in the twenty-seventh memoir of the British School of Archaeology in Egypt in 1914, and Mr. Winlock explains in his preface why a further study of the find has become necessary. He devotes a whole chapter to the number and size of the caskets which must have held the jewels; and shows, from the position in which the objects lay as well as from the scraps of related and unrelated inlay, that there must have been five boxes; the personal jewellery in one, the alabaster perfume vases in the second, the obsidian vases in the third, the crown in the fourth, and the ceremonial wigs in the fifth. The whole chapter is a fine piece of reconstruction. An interesting point is that enclosed in the large cowrie and leopard-head girdle-beads were little pellets of stone or copper which make a tinkling sound against the gold when gently shaken. In the appendix are the analyses of the bronze and silver objects, as well as the contents of the cosmetic and oil vases. Altogether this is the finest study of a group of royal objects yet published, and will serve as a book of reference to all archaeologists.

M. A. M.

*The Bucheum.* By Sir ROBERT MOND and OLIVER H. MYERS. With chapters by T. J. C. BALLY, D. B. HARDEN, J. W. JACKSON, D.Sc., G. MATTHA, and ALAN W. SHORTER; and the Hieroglyphic Inscriptions edited by H. W. FAIRMAN. 3 vols., pp. 203, 92, pls. 172. Egypt Exploration Society. 1934. (Oxford University Press.) 42s.

This is an important publication for several reasons. The material is late in date, ranging from Nectanebo II to the emperor Diocletian; it therefore covers a period which, in Egypt, has been extraordinarily neglected. In these three volumes the authors give a detailed study of the stelae, the brickwork and the burial objects, with special reference to the dating; a contrast to the majority of excavating records which barely mention Ptolemaic and Roman remains. Besides these details, Mr. Myers has also worked out the ritual of the embalming of a divine bull, partly from the papyrological records, partly from the evidence of the Buchis mummies and the embalming implements found in the Bucheum. The result is a clear exposition of the whole process. The excavation of the Baqaria, as Mr. Myers calls the cemetery where the mothers of the divine bulls were buried, is of interest as it is the first time that such a cemetery has received attention. Mr. Myers devotes two chapters to the architecture and brickwork, with a discussion on the unit of measure and three pages of tables of the sizes of bricks. The second volume deals with the inscriptions—hieroglyphic, demotic, Greek, and Coptic. Except for some information as to the burial rites of Buchis and a few historical points the inscriptions add little to our knowledge of the subject or period, though the translations were made by such competent scholars as Fairman, Mattha, Hunt, and Crum. The plates in Vol. III illustrate every aspect of the work; the individual photographs and line drawings are adequate for the purpose but the general arrangement of the plates is unpleasing. There is one sentence in the book which must give a shock to any excavator who reads it, "there was not anyone in camp with a technical knowledge of pottery, and of the many people who drew the pots

published, not one had ever drawn a pot before he came to Armant". In these days of training schools in archaeology this statement can only mean that a party of men, untrained in that important branch of archaeology, were let loose on a site and that valuable evidence must have been lost for ever. It is to be hoped that before long such loss of evidence, even though due to ignorance, will be regarded as little short of a crime, and that the archaeological authorities in every country will take steps to prevent any but fully trained persons from carrying out excavations. In spite, however, of the loss to our knowledge which has occurred, the book has preserved for us a very great deal of information of a neglected period. It is a book which no archaeologist can be without, particularly the Egyptologist, for whether he be interested in the Ptolemaic and Roman periods or not, he will find a great mass of material on which to work.

M. A. M.

*Excavations at Kish.* Vol. IV, 1925-30. By L. CH. WATELIN and S. LANGDON. Pp. vii, 72, pls. XLV, and 7 text figures. 1934. (Paris: Paul Geuthner.)

This very welcome addition to the archaeology of Kish is the last contribution of M. Watelin on the excavations of that site, for that distinguished savant died in January, 1934, whilst on his way to Easter Island.

The book deals largely with the deep excavations N.W. of the great Ziggurat of Hursagkamma which were made by M. Watelin, who despite great difficulties, and in some parts working with the aid of pumps beneath water-level, unearthed much of the early history of this part of Kish.

Below a red stratum, averaging 1.5 metres in thickness, an almost sterile layer resting on a bed of clay extends all over eastern Kish below plain-level. Beneath the clay, which had been deposited by a flood, buildings were found to extend down to water-level some six metres below the surface of the alluvium.

The earliest traces of human occupation were microlithic implements (mainly borers), which M. Watelin suggests were manufactured by a people that moved from the Syrian plain when that area became arid. These implements were associated with ash-beds, averaging 0.30 metres thick, accompanied by fragments of fresh-water mussel-shells, some of which had served various purposes, and were perforated, and even strengthened with bitumen.

Immediately above this ash layer evidences of the Jemdet Nasr Period included pottery and other objects, lying about half a metre below the level of the sub-soil water. Between the water-level and the overlying thick flood bed of clay, already mentioned, which M. Watelin suggests on excellent evidence was laid down c. 3,000 B.C., were unearthed Cemetery Y and the earliest buildings that have as yet been found at Kish.

These buildings below flood-level were well planned structures, and a definite street was found and well thought out drainage systems. They were built of mud bricks of plano-convex type, and baked bricks of the same type had been used for the pavements. In some of the rooms there were coarse flint implements, such as borers, scrapers and sickle blades, together with small fragments of copper. The people who built these habitations had been flooded out more than once, but returned to repair their homes. They made roughly modelled bitumen figurines of bearded men with long hair, of a type definitely Sumerian, and also models of various animals. One of the most interesting objects found was a pottery two-wheeled chariot with seven model equines, five of which seem to have been "surplus to establishment".

In the same layer was found a cemetery (Y), in which the graves contained unpainted pottery that is said to be of the same date as the houses. Some of the bodies lay in the rooms of the houses in a half-crouched position, and they were wrapped in mats. With the bodies were laid the ornaments and other belongings of the dead, in no definite position except for a cup held between the hands near the face. It appears that copper was the only metal used for the daggers, lance-heads, chisels, axes, saws, and fish-hooks that lay with the bodies. Stone implements, including knives, celt-axes and sickle blades, were also found in these graves. That copper was plentiful and had other uses at this period is shown by ornamental supports, made expressly to hold metal and stone vessels.

Remains of wooden chariots were found in some of these "Y" tombs, and the forms of some of the metal implements and of many of the other objects in them, such as rein guides, would equate them with the "gold" burials at Ur. It is therefore interesting to see that M. Watelin, independently, would assign his "Y" Cemetery to the same date as Dr. Woolley does his royal tombs, namely, 3,200 B.C.

The red stratum above the flood layer, I should like to mention here, was found also to occur around the ziggurat of Kish. Few objects were found in this red stratum which is composed of fine particles of decomposed burnt brick, the most noticeable being an engraved schist plaque, fragments of statuary and a very fine painted pottery head (Pl. XXX). Professor Langdon is inclined to date this head to the Jemdet Nasr Period, but to this M. Watelin does not agree. There is a remarkable facial resemblance between this head and the royal figure on the slate and limestone plaque that was found in the Palace at Kish, and I have no doubt myself that both pottery head and plaque belong to the Early Dynastic Period. In the red stratum were also found sporadic graves of the "A" Cemetery period, but judging from their contents these were the tombs of wealthier people.

On pp. 59-64 of this book Professor Langdon deals with the epigraphy and seals of the "Y" Cemetery. A most interesting appendix by T. K. Penniman (pp. 65-72) on the inhabitants of Kish before the flood starts with the statement that the cranial evidence proves a mixed race at all periods at Kish, including the Eurafrian, the Mediterranean, and the Armenoid. So far, however, the Mediterranean type has not been definitely traced at Kish before 3,100 B.C.; but a large amount of skeletal material from this level still remains to be examined, and both Mr. Penniman and Dr. Buxton think that this type will prove to be as common as the other two.

One could wish that an archaeological book of this nature had been provided with an index; even a list of the plates is omitted. E. M.

*Topographical Bibliography of Ancient Egyptian Hieroglyphic Texts, Reliefs, and Paintings: Vol. IV, Lower and Middle Egypt (Delta and Cairo to Asyut).* By BERTHA PORTER and ROSALIND L. B. MOSS, B.Sc. Pp. 294. 1934. (Clarendon Press.) 35s.

This is the fourth volume of a stupendous bibliography of all known texts, reliefs and paintings of Ancient Egypt. The first and second volumes dealt with Thebes, the third with Memphis and its important cemeteries; the present volume covers the Delta and the Nile Valley as far south as Asyut. The accuracy of the work is astounding, in all the thousands of references the number of mistakes is practically nil, so that these volumes are of the utmost value to



all Egyptologists for reference purposes; and in saying that the present volume is as good as its predecessors one can bestow no higher praise. Maps of the Delta, the Fayum, and the river valley from Cairo to Asyut, as well as sketch maps of sites and plans of tombs, add to the value of the book. The indexes include names of kings, periods, royal and private names, and lists of divinities, besides a geographical index. Both authors may be congratulated on keeping up the high standard which they themselves set in their previous volumes.

M. A. M.

*Ancient Egyptian Materials and Industries.* By A. LUCAS. Pp. xii, 447. 1934. (London: Arnold.) 16s.

This book is a second edition of a smaller book, "Ancient Egyptian Materials," which Mr. Lucas wrote some years ago. A great deal of new matter has been incorporated as a result of the many discoveries made in Egypt in recent years.

Not only is this volume of great value to the archaeologist; it should be found in every technical library, if only to prevent statements by the uninformed that the ancient Egyptians knew processes and dealt with materials that we now know could not have been the case.

Each of the fifteen chapters deals with a different aspect of the crafts that were practised and the materials used in ancient Egypt, which facilitates easy reference to the subject required. The last chapter, an historical summary, is a very important part of the book; and it is followed by an appendix in which are collected a number of useful analyses by the author and other experts, which have already appeared from time to time in various journals.

The reviewer, who long since left archaeological work in Egypt for excavations in other countries, has everywhere found Mr. Lucas's earlier book of the utmost value; the usefulness of the present volume will be the greater that the principal civilisations of the ancient East are now known to have traded very extensively with one another. That they drew supplies from sources that it had not previously been realised they knew has been revealed by excavations all over the East. The ancient civilisations were linked up by trade and through that medium were well acquainted with one another.

I cannot think that many further materials remain to be found in Egypt, and it is to be hoped that one day Mr. Lucas may be able to devote his great talent to similar studies in other countries where excavations are proceeding—in Palestine and Syria, Persia, Iraq, and India.

This is by no means a book that only experts can comprehend; it is thoroughly readable throughout and full of interest to the layman, even though he have only a superficial knowledge of the subjects dealt with by the author.

E. M.

*The Preservation of Antiquities.* By H. J. PLENDERLEITH. Pp. viii, 71; pls. II, 5 text-figures. 1934. (Published by the Museums Association, London.) Price to non-members, 2s. 6d.

Dr. Plenderleith is to be congratulated on this little book. It is one of a series dealing with matters of interest to the museum curator, for whom it is primarily intended. Yet though much of the apparatus to be used could hardly be found in an archaeological camp, many of the receipts and processes given will be of the utmost use in the field. Indeed, this very inexpensive book should form part of every camp library. No longer is it to be regarded as sufficient after the extraction of an antiquity from the soil to pack it up in an untreated

condition for transport abroad. In several instances lately, boxes of antiquities have been delayed for months in transit under conditions which have not conduced to the safe preservation of their contents. Dr. Plenderleith tells us in clear language what should be done to ensure the safe arrival of objects at the museum, where they can, if necessary, receive a final treatment.

The book is not only of interest to the expert at home and to the field archaeologist; librarians and collectors of furniture and textiles will also find in it much of profit. A full bibliography and an adequate index complete a most valuable collection of practical information. E. M.

Messrs. Lovat Dickson and Thompson have been well advised in issuing a series of small books on archaeological subjects. Such summaries, written by competent authorities, are greatly in demand, and the venture should be a success. The first two books of the series are reviewed below.

*Tell el-Amarna.* By J. D. S. PENDLEBURY. Pp. 175, 8 pls. 1935. 6s.

This is a convenient summary, written in popular form, of all the known facts and many of the theories concerning the site and the personages of el-Amarna. The general reader's sentimental interest in Akhenaten is probably due to that Pharaoh's supposed monotheism and his revolt against the established religion; the epithet of "the Heretic King" has a romantic appeal. The wealth of Tutankhamen's burial also strikes the imagination, and the sorrowful beauty of Nefertyti's portraits rouses the sympathy, almost the affection, of the modern world. A book on el-Amarna by Mr. Pendlebury is therefore very welcome and should be widely read.

*The Indus Civilisation.* By ERNEST MACKAY. Pp. 202, 16 pls. 1935. 6s.

This is the first complete summary of the finds from Mohenjo-daro. The author, unlike many archaeologists, has resisted the temptation to write in a journalese copied from the lesser magazine writers, but regards the general reader as a person of some education and common sense, with the result that the book is not only interesting for the layman but is a storehouse of facts for the specialist. Dr. Mackay is to be congratulated on this achievement. M. A. M.

*The Desert Fayum.* By G. CATON-THOMPSON and E. W. GARDNER. Royal 4to, Vol. I, pp. 167, text; Vol. II, pls. CIV. 1935. (Royal Anthropological Institute, London.) 30s.

The scientific spirit is too seldom exhibited in archaeology even to-day. The present volume is valuable, apart from the information it contains, because it is permeated by that quality; much that was remote from the original enquiry has been thoroughly investigated and described by the authors and their work has been worthily rewarded.

The most important parts of the book are the geological study of Lake Moeris and the description of the Neolithic cultures which developed on its borders. It is shown that the history of the lake since Neolithic times has been one of intermittent contraction. Ptolemy Philadelphus did not drain the lake to provide land for his soldiers, but constructed a series of irrigation works—obviously a more sensible proceeding. The writers demonstrate that the "quay" at Dimai is "the free-standing portal of a long processional approach through the town to the temple precincts". Despite the strength of the opposition to these views, the evidence, which is clearly presented, appears irrefutable.

Only the settlements of the Neolithic peoples were found, extensive search for the cemeteries unfortunately proving fruitless. Nevertheless, much of interest was established, though the exact connections with the Middle and Lower Egyptian Early Predynastic II (Tasian and Merimidian) cultures cannot be made as yet. An important feature of the lives of these Neolithic people was agriculture, though they also fished in the lake and hunted its borders. With the exception of their ceramic industry, they appear to have been further advanced than the (probably) contemporary cultures in the Nile valley, but the evidence is at present slender.

Remains of the Old and Middle Kingdoms are recorded, and much of importance from the Graeco-Roman period. There are some excellent typological and technological studies. Even in these full volumes there are one or two omissions, the most notable of which is that of the metrology, the dimensions of the buildings excavated and described. The plans are exceptionally good.

O. H. M.

*Mareotis, being an Account of the History, Topography, and Antiquities of the North-Western Desert of Egypt and Lake Mareotis.* By ANTHONY DE COSSON. 8vo., pp. 219, 16 pls., 5 plans and maps. 1935. (London: Country Life, Ltd.) 15s.

However absorbing the more technical aspects of archaeology, it is pleasant sometimes to turn aside to a more general view of a site, its people and history. Mr. de Cosson has a passionate interest in the district he is describing, and in all that bears on it, and, though he has not command of the vivid phrase of a Kipling or Wells to bring the past breathtakingly into the present, he has yet a pleasant and persuasive style.

The book divides roughly into two sections, the first historical, the second geographical, and a more deliberate distinction, with chapters XVIII to XXIII redistributed, would have made for greater compactness. The author has consulted all possible authorities from classical to modern Egyptological for any information they might give, and has probably placed on record everything that is yet known about the area. In fact, it is impossible not to feel that the information might have been given in a smaller space. There are some useful appendices, including an analysis of glass slag and, notably, a contribution on the flora of the region by Professor Oliver. The plans are clear and the plates excellent. The Arabic transliteration might have been more systematic, the use of the letter *p* being misleading.

Mr. de Cosson must be congratulated on having compiled a very readable volume of useful information. It is to be hoped that this book will encourage systematic archaeological research in the district, and that Mr. de Cosson will one day write a new history of it—with the gaps filled. This book is as sound a foundation for future work as any excavator could desire.

O. H. M.

*Work in Western Thebes, 1931-33.* By HAROLD H. NELSON and UVO HÖLSCHER. With a chapter by SIEGFRIED SCHOTT. Pp. 118, 62 illustrations. 1935. (The Oriental Institute of the University of Chicago: Univ. of Chicago and Camb. Univ. Presses.) 5s.50.

This is a summary in a cheap and convenient form of the work done at Medinet Habu during three years. The first part is a study of the calendar of feasts with the offerings for each feast. Though not by any means exhaustive, the study is interesting and raises as many problems as it solves. The second

part deals with the excavations of the western fortified gate, the western chapels and the temple of Eye and Harmhab. These excavations conclude the architectural work of the American expedition. Dr. Hölscher gives merely the preliminary account of what was done; the full account with all details of buildings and of the objects found will be published in one of the magnificent volumes of the Oriental Institute of Chicago.

M. A. M.

PREHISTORIC SURVEY OF EGYPT AND WESTERN ASIA. Oriental Institute Publications, University of Chicago. Vol. II. *Palaeolithic Man and the Nile Valley in Nubia and Upper Egypt*. By K. S. SANDFORD and W. J. ARKELL. 1933. 28s. 6d. Vol. III. *Palaeolithic Man and the Nile Valley in Upper and Middle Egypt*. By K. S. SANDFORD. 1934. 31s. 6d.

At a time when floods loom large in the discoveries of excavators, and "pluvial" and "interpluvial" periods are suggested to explain various phenomena and the mass migrations of early man, a restrained and well balanced account of purely geological evidence is invaluable. Of the geological survey of Egypt and Western Asia undertaken by the Oriental Institute of Chicago, these two volumes by Drs. Sandford and Arkell, the second and third in the series, will be indispensable to both geologist and archaeologist; to lovers of the Egyptian landscape also they provide a fascinating commentary on the colours and contours of the desert scene.

In Volume II, an interesting chapter by Dr. Arkell deals with rock pictures of the Nile valley from those early times when the giraffe seems to have been known, but not the camel, down to modern days. In the chapter on Human Industries, Dr. Sandford most usefully examines the dating of implements, which were all found *in situ* in the various "terraces", by geological means rather than by their types; and he correlates the "terraces" with the Mediterranean beaches.

There is evidence that "Nubia had lost its rainfall by Lower Sebilian times," whereas the rainfall "had virtually ceased in Upper Egypt by Upper Sebilian times." In Vol. III, we read further that "there seems to be agreement that rain was falling in the Fayum in Mousterian times. The Nile and its tributaries certainly point to the same conclusion. . . . Although the climate was changing radically in the south and the change was creeping northward, the north as a whole was not yet a desert, but was beginning to enter a stage of deficient run-off of surface water. This became more marked as the Nile's aggradation progressed." A careful review of the Fayum controversy follows.

Dr. Sandford accepts "the general figure of 4-4½ inches per century (for the deposit of the Nile alluvium throughout the historic period) as almost the only fact of archaeological or geological importance that we really know concerning the bed of the Nile."

Aurignacian work has as yet only been identified in one spot (near Nag<sup>c</sup> Hammadi). The Hilwan industry, probably a phase of Capsian, seems to have long preceded the Neolithic age in Egypt, and pages are missing from the pre-Neolithic history of the Nile valley.

In conclusion, Dr. Sandford emphasises the many climatic and ecological changes that mark the growth of absolute desert; all vary locally from meteorological causes, and especially from the nature of the strata. He can "see no evidence or justification for defining its climate (that of the Nile Valley) in terms of 'pluvial' or 'interpluvial' periods".

D. M.

## JOURNALS.

ASSOCIAZIONE INTERNAZIONALE STUDI MEDITERRANEI. V, 4, 5.

LAKE, AGNES KIRSOPP.—*The Pottery Deposit at Minturnae*.—This is a careful and detailed study of black Campanian ware found in a dump of "wasters" from a pottery. The wide distribution of this ware over the Mediterranean area gives importance to this article, which is well illustrated. The alteration in colour of the black "glaze" is discussed. Miss Lake suggests that it is due to over-firing; but it is possible that the over-firing was intentional, as discoloration of the same kind is also seen in the Campanian ware found in Minorca. M.A.M.

Do. V, 6.

CAPPARONI, Prof. P.—*La malattia nell'uomo della preistoria e dell' antico Egitto*.—This interesting paper summarises present knowledge of palaeopathology, more especially in respect of ancient Egyptian evidence of disease.

ANNALS OF ARCHAEOLOGY AND ANTHROPOLOGY—UNIVERSITY OF LIVERPOOL. Vol. XXI, Nos. 3, 4. 1934.

BROWN, T. B.—*Achaean Pottery*.—The writer argues that "it is unreasonable to reject the possibility of an Indo-European Aegean at the beginning of the Bronze Age." He considers that the Achaeans of the Aegean were closely related to the people of the Hittite Empire.

DUSSAUD, R.—*Ras Shamra*.—A brief but important summary of the knowledge obtained by the excavation of the three uppermost strata during the six campaigns of 1929-34.

GARSTANG, J.—*Jericho: City and Necropolis*.—This fourth report on the excavations deals principally with the Palace Area, its storerooms and their contents, and with the painted pottery of the Middle and Late Bronze Age. A tablet bearing a few cuneiform characters proved to be most disappointingly damaged (possibly by the scribe), and is undateable, though probably not earlier than the el-Amarna tablets.

JOURNAL OF THE AMERICAN ORIENTAL SOCIETY. Vol. 54, No. 4. Dec., 1934.

STURTEVANT, E. H.—*A Hittite Text on the Duties of Priests and Temple Servants*, transliterated and translated, contains interesting matter even to the non-philologist.

Do. Vol. 55, No. 1. March, 1935.

Mainly concerned with the Ras Shamra liturgical poems and script. D.M. EGYPTIAN RELIGION. Vol. I, no. 3. October, 1933. (Publication of the Alma Egan Hyatt Foundation, New York.)

DOMBART, T.—*Der zweitürmige Tempel-Pylon altägyptischer Baukunst und seine religiöse Symbolik*.—The two-towered pylon forming the entrance to Egyptian temples is explained as representing the horizon. The author brings forward a considerable amount of evidence in support of his theory.

PIANKOFF, A.—*Nefer-Toum et Mahes*.—By association with Mahes, Nefertum came to be represented as a lion-headed god. Mahes is sometimes shown as a lion attacking from behind a prisoner whose hands are bound. The origin of this group is to be found in military compositions of the New Kingdom.

LEXA, F.—*La légende gnostique sur Pistis Sophia et le mythe ancien égyptien sur l'œil de Ré*.—The writer traces a resemblance between the essential traits of the Gnostic legend of Pistis Sophia, of which he prints five chapters in transla-

tion, and the ancient Egyptian myth of the Wanderings of the Eye of Ra, and suggests an explanation for the admission of this myth into the Gnostic system.

CAPART, J.—*Thème religieux ou fantaisie*.—Capart describes and figures an ostrakon with a queen, Merit-Amen, reaching out a hand to a duck, which, judged by itself, would seem merely to register an idle moment, were it not that a somewhat similar scene on a relief in the Temple of Edfu showing the Pharaoh with a duck has been described as probably one of the episodes in the ceremony commemorating the victory of Horus, which was celebrated on the 21st of Mechir of the Edfu Calendar.

Do. Vol. II, no. 1. January, 1934.

BOESER, P. A. A.—*Some Observations on a Moral Text in Demotic*.—This papyrus was purchased in 1895 by the Rijksmuseum van Oudheden in Leiden. It contains many close parallels with passages in the Psalms and Proverbs and, above all, in Ecclesiasticus.

HALLOCK, F. H.—*Christianity and the Old Egyptian Religion*.—The writer concludes that "Christianity is in no essential respect different from what it would have been had there been no preparation for it on Egyptian soil; at the same time, there was, in Egypt as elsewhere, preparation, and Christianity is the richer by the contribution of its forerunner." This article is disfigured by printer's errors, such as "Pharoah."

Do. Vol. II, no. 4. October, 1934.

SUYS, É.—*Les Messagers des Dieux*.—As the religion developed, evil spirits no longer only menaced the dead at the entrance to the next world, but they invaded this world either spontaneously or at a god's command. The only weapon that could be used against them, once they had gained free access to this world, was magic. This article was in the press before the author had seen the Edwin Smith Papyrus; in the incantations at the end of this papyrus, the executioners in the following of Sekhmet, far from confining themselves to the other world, as in Chap. 145 of the Book of the Dead (Papyrus of Katseshni), play an important part in spreading disease, especially the "pestilence of the year."

BISSING, FREIHERR W. F. VON.—*Eine Stele des Horus auf den Krokodilen aus einer Aedicula Konstantinischer Zeit*.—There is a small illustration of this stela in Stuart Jones' *Catalogue of the Ancient Sculptures preserved in the Municipal Coll. of Rome, Palazzo dei Conservatori*, pl. 119. On this stela the figure of Horus is crowned with a large head of Bes; the remarkable feature of the representation is the presence of two animal's ears on the head of Horus, perhaps an animal's hide on which the head of Bes rests. Von Bissing considers that these ears must have been transferred to Horus from the dwarf god Ahati (see Ballod, *Prolegomena zur Gesch. d. Zwerghaften Götter in Aegypten*, pp. 27 ff., 71 f., 86 f.).

ORIENTALIA. Vol. II, Nova Series, Fasc. 3. 1933. Rome.

POLOTSKY, H. J.—*Ephraem's Reise nach Aegypten*.—In the Syriac *Vita* of Ephraim, the saint is said to have stayed eight years in Egypt. This detail is not confirmed by any other source and is in itself improbable, and the journey to Egypt has, therefore, been considered legendary, though no satisfactory reason has been given for the rise of the legend. The writer offers the following explanation: There are two texts of the Syriac *Vita*, of which one, the Vatican, states that at the beginning of his stay Ephraim first visited the

hermit Pishoi and spent a week with him. The writer considers that the *Vita* borrowed this incident from the Syriac *Life of Pishoi*, where (in the Greek translation) Pishoi's visitor is referred to without a name as a hermit from Syria.

Do. Vol. III, Nova Series, Fasc. I. 1934.

KARST, J.—*Aïa-Kolchis et les Chamites septentrionaux*.—The writer finds a basis of truth in the statement of Herodotus (II, 104) that the Euxine Colchians were Egyptian.

SUYS, É.—*Le papyrus magique du Vatican*.—The Catalogue of the Vatican Museum (O. Marucchi, *Il Museo egizio vaticano*, Roma, 1902, p. 283) mentions under no. 19a some fragments of papyri of the XIXth-XXth dynasty, of which Erman transcribed the first page and gave a translation in *Zeitschrift XXXI*, 1893, pp. 119 ff. The papyrus is now to be detached from its backing so that the fragments may be arranged in their correct order, when the verso, which is covered with magical formulae different from those of the recto, will be available for publication. An attempt to translate the only passage of the verso which can be read is made here. The recto, of which a provisional study is published in this article, contains incantations exorcising a poison, whose power is checked in each limb by the god who occupies the limb. These incantations are preceded by an account of the hastening of Horus to the aid of Set, who has been poisoned; Horus cures Set by his magic and by his ministrations.

Do. Vol. III, Nova Series, Fasc. 2. 1934.

SIMON, J.—*Le culte des XL Martyrs dans l'Égypte chrétienne*.—Evidence is collected in this article to show the popularity of the Forty Martyrs of Sebaste in Christian Egypt.

O'LEARY, DE L.—*A Greek Hymn in a Coptic Manuscript*.—On ff. 117, 118 of the Codex in the Bibliothèque Nationale in Paris, which is numbered *Copte 129<sup>20</sup>*, is "an alphabetical hymn on the Resurrection, in what is intended for Greek, not a corrupt copy of a Greek composition. It is the result of an attempt on the part of a Coptic writer to put together a hymn in Greek words, of a type by no means unknown in Coptic manuscripts. It seems impossible to restore a coherent Greek passage from material of this sort, but the general sense seems fairly intelligible." L. B. E.

ZEITSCHRIFT FÜR AEGYPTISCHE SPRACHE, LXIX, Part I. 1933.

STEINDORFF, G., RICKE, H., and AUBIN, H.—*Der Orakeltempel in der Ammonsoase*.—This article embodies the result of preliminary excavations at Aghûrmi, the supposed site of the temple of Amon in the Libyan desert. The temple was not Egyptian in origin, but had been given an Egyptian appearance by conversion later, at an unknown date. The wall paintings and texts are very corrupt and probably not of Egyptian workmanship. The cult object in the temple is known from ancient accounts to have been an *omphalos*, and Steindorff holds that the finding of an *omphalos* at Napata (*J.E.A.*, III, 255) supports the view that the oracle in the oasis of Amon was founded in the Ethiopian period.

REISNER, G. A., and REISNER, M. B.—*Inscribed Monuments from Gebel Barkal. Part 2. The granite Stela of Thutmosis III*.—A description of the stela found in the first court of the great temple of Amon at Barkal (B. 501). The text is given and translated in full: the crossing of the Euphrates, the invasion of Naharain, the battle, siege, and surrender of Megiddo, etc. The first

part of this article appeared in ZEITSCHRIFT, LXVI (see ANCIENT EGYPT, 1932, iv, p. 121).

WOLF, W.—*Neue Beiträge zum "Tagebuch eines Grenzbeamten."*—A further study of the notes on the verso of columns 6 and 5 of Anastasi Papyrus III, known as the "Diary of a Frontier Official," in the reign of Merenptah. The writer's translation of 6, line 9, shows that the Court was in Egypt in this year, so that it is no longer necessary to assume that Merenptah was on a campaign in Syria then, as was believed from the earlier reading.

ROEDER, G.—*Die Herstellung von Wachsmodellen zu ägyptischen Bronzefiguren.*—The writer observed that bronze figures of gods, animals, etc., show joins which always occur at the same places. From a study of these lines of suture he has worked out the Egyptian method of casting bronze from wax models. The wax models for the various parts of the figure were prepared in plaster moulds composed of several parts. Unfortunately, none of these moulds have as yet been found dating to Pharaonic times; nor do the plaster moulds from Memphis throw light on the Egyptian method of casting, as they were used by workers trained in the Greek school. The wax models thus prepared were used for casting solid figures. All but the very small Egyptian bronzes were made by a combination of solid and hollow casting, and the writer adds a hypothetical account of the Egyptian process of hollow casting.

SACHS, C.—*Eine ägyptische Winkelharfe in der Berliner Musikinstrumentensammlung.*—This harp corresponds in every detail with one in the Louvre. It has been left in the state in which it was found; a restored copy has been made which can be played upon, knowledge of the strings and pitch having been gained from a relief of Assurbanipal in the British Museum.

GARDINER, A. H.—*The supposed particle 𓂏.*—This particle occurs only in the collocation 𓂏 𓂏 𓂏; it is here considered to be an abusive variant of 𓂏.

L. B. E.

ZEITSCHRIFT FÜR AEGYPTISCHE SPRACHE, LXIX, Part 2. 1933.

REISNER, G. A., and REISNER, M. B.—*Inscribed monuments from Gebel Barkal.*—A badly preserved stela (Monument No. 20 in writers' list) was found in the great temple of Amon in the third hall of columns (B. 503). There is no definite indication of the original place of the stela. It was found face downwards, having been used as a paving stone, and is in three disjointed fragments. These have been reconstructed and yield twenty lines of inscription, but only the last line is completely preserved. The figures and inscriptions of the top of the stela are in relief, carved in the well known style of Sety I, but they are not of the fine quality of the contemporary monuments in Egypt; the workmanship is entirely different from that of the inscription below, and may be by quite a different hand. The date, year 11, is certain; it is the latest known date of Sety I, seven years later than that of the great inscription at Nauri (Griffith, *J.E.A.*, XIII, p. 193).

SENK, H.—*Vom perspektivischen Gehalt in der ägyptischen Flachbildnerei.*—If reproduction in a three-dimensional sense is meant by drawing in perspective, then it is true that the Egyptians never used perspective. But the writer argues that an effect of perspective is aimed at in Egyptian sculptures in relief, a compromise between following and rejecting the laws of true perspective. Egyptian reliefs show, in fact, a special kind of perspective drawing in combination with the drawing of objects as they really are. Plate IX, fig. a, is particularly instruc-



tive, showing different planes, reduction in size of figures, and movement towards the interior of the picture.




PIEPER, M.—*Ägyptische Kunst und Vorderasien*.—A short essay on the importance of scarabs in ancient art-history, with an illustration of a Hyksos scarab (Berlin 1969r) showing a falcon-headed man kneeling on one knee, an attitude well known in Greek art and also earlier (Crete and Babylonia).

BISSING, FR. W. VON.—*Gefäßmodell aus Leontopolis*.—In the vases discussed in this article the vase portion is held in the fore-paws of a lion. Two specimens are from the Fouquet Collection, two are at Berlin, and the remaining one is a limestone model now at The Hague. The writer suggests that they may be dated to the last pre-Ptolemaic period and are to be regarded as the final flicker of native Egyptian art.



SPONSHEIMER, H.—*Frühgriechische Parallele zu ägyptischer Zeichenweise*.—Fig. 104 in Schäfer's *Von ägyptischer Kunst*, 3rd edition, reproduces a mummy case on which the vulture's head painted on the breast is shown projecting from the case as if it were modelled. The writer illustrates and describes a scene on a Greek vase in which the head of a serpent encircling a shield is rendered in the same way.

RANKE, H.—*Eine alte Anspielung auf den Mythos von Horus und Seth*.—It is difficult to make sense of Pyr. 128b as it stands: "As Set spurns the *mt* of these two companions who traverse the sky." Proceeding from Pyr. M and N, which give a different reading, Ranke supposes that the passage was originally in two parts, the second part being addressed to "Ye two companions who traverse the sky," whilst the first part would have read, "As Set spurns the *mt* of his companion" (i.e., the *mtwt* of Horus (for which, see Gardiner, *Chester Beatty Papyri*, No. 1, Pls. 11, 8/9, 11, 12, and 12, 9)). If this be correct, then the Vth dynasty pyramids may occasionally preserve an older and better version than Unas, and we may have to reckon with extreme corruption even in the Pyramid texts.

WOLF, W.—*Zur zweiten Auflage von Ermans Neuägyptischer Grammatik*.—Some twenty-seven passages in the second edition of Erman's New Egyptian Grammar are discussed here.

TILL, W.—*Der Irrealis im Neuägyptischen*.—If the first clause be an unfulfilled wish, there is nothing in the following clause to indicate the unreality of the statement. In every other case the main clause must be introduced by e, whilst the preceding clause as a rule contains no indication of unreality. Following e are Present II, Future III, or .

SETHE, K.—*Ein demotischer Prozesscid*. (*Ostrakon der Sächsischen Landesbibliothek im Dresden*.)—The special interest of this ostrakon lies in the last three lines, which may be translated, "Herieus, her husband, has sworn in her hand, this oath is a true one". The reading "in her hand" elucidates a phrase on other ostraca with oaths, of which Sethe and Spiegelberg have given differing translations.

EDGERTON, W. F.—*Demotic writings of ⲙⲡⲁⲧⲉ*.—Discussions of the etymology of the Coptic tense ⲙⲡⲁⲧⲉ ⲙⲱⲧⲙ, "he has not yet heard," have been unfavourably affected by an alleged demotic group said to occur in the demotic P. Ryl. IX, 3.3. The writer is now convinced that no such form occurs either in 3.3 or elsewhere, and he submits that it is time to drop the elements , *p*, and , *rc*, from our transliterations of the demotic examples.

L. B. E.

## NOTES AND NEWS.

Among the King's Birthday Honours, the Knighthood conferred upon Charles Leonard Woolley will be greatly appreciated by archaeologists, not only for the honour bestowed upon a brilliant and indefatigable worker, but for the recognition it carries with it of a subject whose importance is now being more fully realised. The remarkable discovery made by Sir Leonard Woolley of the barbaric and magnificent funeral rites of the Sumerian kings made a deep impression on the popular imagination ; that find, however, represents but a small part of the unremitting labour that has unravelled the history of the city-state of Ur. In his work there for the last decade he has been most ably seconded by Lady Woolley, to whom with him we offer hearty congratulations.

In *Man* (March, 1935) Sir Charles Peers gives an interesting resumé of the Ancient Monuments Act (1934) of the Union of South Africa. Its provisions seem to be fair and satisfactory, and the establishment of a National Bureau of Archaeology with Mr. C. Van Riet Lowe as Director is welcomed. Sir Charles Peers suggests, however, that "to expect adequate administration from a body of unpaid Commissioners argues some inexperience in the framers of the Act"; he regrets that "the experience of other governments was not taken into account in this connection."

In the latest *Bulletin* of the Museum of Fine Arts, Boston (1934), it is pleasant to read that the Joint Expedition to Persia directed by Dr. E. F. Schmidt has "received the closest co-operation from the Persian Government," which also "has been absolutely fair in the division" of the finds. Friendly co-operation between the government of the country where excavations are made and the excavators and their supporters results not only in an increase of knowledge of the past, it enriches the museums of both countries—as Baghdad has every reason to be aware—and gives local employment that is highly valued by the villages in the neighbourhood of the sites.

To the Metropolitan Museum of Art, New York, the Persian Government has granted permission to excavate at Nishapur, in Khurasan—yet another to be added to the important expeditions at work in that country.

In addition to its expeditions to Egypt and Persia, the Boston Museum of Fine Arts has now undertaken a third, to Chanhudaro, in the Indus valley, some eighty miles southwards of Mohenjodaro. This is a joint expedition with the American School of Indic and Iranian Studies, whose President, Professor W. Norman Brown, has just returned from a visit to India where he negotiated the arrangements for this excavation. The expedition is to be directed by Dr. E. Mackay.

Popular interest in the discoveries of archaeology in all parts of the earth seems not to wane. Such new fields as Ireland, Greenland, and Siam are now figuring beside the more familiar fields of the Near and Middle East, Europe, Central America, and East Africa. The illustrated monthlies and weeklies, notably *Discovery* and the *Illustrated London News*, publish excellent and authoritative reports of excavations for the general reader.

The first season's work of the Gaekwar of Baroda Greater-India Research Expedition, led by Dr. Quairies Wales, has produced interesting evidence of the early eastward spread of Indian cultural influences.

## OBITUARY.

## SIR ERNEST ALFRED WALLIS BUDGE.

1857-1934.

THOUGH he will be remembered chiefly as Keeper of the Department of Egyptian and Assyrian Antiquities in the British Museum, an office which he held for over forty years, Sir Wallis Budge had in earlier days excavated various sites in the Near and Middle East. He wrote a number of books on Oriental subjects which did much to arouse the popular interest in archaeology that was later to be so greatly stimulated by the discovery of the tomb of Tutankhamen. The friendly interest shown by Sir Wallis Budge in the work of Indian archaeological students at the London University is appreciatively spoken of by them in India to-day.

## BERTHOLD LAUFER.

1874-1934.

Archaeology was only one of the many interests of Dr. Berthold Laufer ; yet it is fitting to pay tribute here to one whose loss is great not only to the Field Museum, Chicago, but to the world of scientific exploration. A great scholar, Dr. Laufer was particularly interested in the Far East, whither he had led four expeditions ; but to him his extraordinarily diverse investigations all centred round one main idea, the history of the onward march of civilisation.

## THOMAS EDWARD SHAW.

1888-1935.

Before the Great War, T. E. Shaw—Lawrence of Arabia—had already made his mark as an archaeologist. With his remarkable understanding of the East that had to be ; even before he joined the British Museum expedition at work at Carchemish, at the instance of the late Dr. Hogarth, he had as an undergraduate wandered over Syria and Palestine in search of material for his thesis in his Final School. Not long before the war, Lawrence paid prolonged visits to Professor Petrie's camp at Tarkhan and the Palestine Exploration Fund's survey in northern Sinai, and proved himself a refreshing and charming personality. The excavator's life appealed to him, and on more than one occasion in recent years did he express regret at not returning to it. By his untimely death those archaeologists who knew him have lost, with many others, a true and inspiring friend.

## LOUIS CHARLES WATELIN. Died January, 1934.

HERBERT WELD. Died February, 1935.

By these two irreparable losses the Oxford University and Field Museum, Chicago, Joint Expedition to Kish has suffered a dual blow. To Herbert Weld was due the initiation of the expedition in 1922, after he had visited Mesopotamia to discover what archaeological material might have come to light during the war. Professor Langdon undertook the organisation of the expedition at his behest, and during the last seven of its eleven successive seasons M. Watelin acted as its Field Director. A brilliant and untiring worker, he made extensive excavations at the eastern end of Kish, notably that of the Temple of the Earth-Goddess (Harsagkalamma), and of a Sassanian villa. He also continued the excavation of Jemdet Nasr, discovered by his predecessor. At the time of his death, M. Watelin was on his way to Easter Island to investigate its curious script, which has been thought to exhibit affinities to the Indus Valley script unearthed at Harappa and Mohenjo-daro.





FRONTISPIECE.  
GENERAL VIEW OF RUINED TEMPLE OF AIN AMUR.

(See page 108.)

# ANCIENT EGYPT AND THE EAST

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## POTTERY AND BEADS FROM NEAR NEHAVAND, N.W. PERSIA, IN THE ASHMOLEAN MUSEUM.

DURING the last few years the Ashmolean Museum has acquired two small groups of pottery, both said to come from near Nehavand in N.W. Persia. With the second group there were included three strings of beads, which presumably were found with some of the pots.<sup>1</sup>

Specimens of these Nehavand wares have been common in the market in recent years, and are well known to museum curators, but speculation was rife concerning their date and sequence until in 1931 a French expedition led by MM. Contenau and Ghirshman excavated at Tepe Giyan, a mound near Nehavand. They found there a stratigraphical sequence consisting of three layers of superimposed cemeteries, about ten metres thick, and below them habitation strata about eight or nine metres thick. A preliminary report of this excavation was published in *Syria* XIV (1933), pp. 1-14, p's. I-III.<sup>2</sup> A fuller report of the work is eagerly awaited. Some photographs of similar pottery acquired by the British Museum in recent years have been published in various numbers of the *British Museum Quarterly*,<sup>3</sup> and a few stray examples from other collections have been illustrated elsewhere,<sup>4</sup> but no attempt has yet been made to set the study of this pottery on a surer foundation by giving detailed drawings and descriptions of a series of examples. It is the feeling that such an attempt is needed that has led to the writing of the present article.

The account of the strata and finds given in the Tepe Giyan preliminary report makes it clear that amongst the Oxford series of pots there are examples of ware belonging to all three divisions of the upper or "tomb" stratum of that *tell*. No example of ware from the lower or "habitation" stratum appears to be present. This is but natural, for these pots come from clandestine digging in tombs, and not from official excavation of a habitation layer. It is, indeed,

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<sup>1</sup> Pottery—Ash. Mus. 1930. 456-9 : 1934. 38-49.

Beads—Ash. Mus. 1934. 50-2.

<sup>2</sup> Henceforth referred to as *Contenau and Ghirshman*.

<sup>3</sup> *BMQ* III, 69, pl. xxxix ; IV, 4, pl. v ; V, 10, pl. ii ; VII, 80, pl. xxviii.

<sup>4</sup> E.g., Frankfort, *Arch. and the Sumerian Problem*, fig. 10 ; Contenau, *Manuel d'Arch. Orient.*, pp. 647 and 1576, figs. 450-1 ; De Mecquenem, *Mém. Délég. en Perse*, XX, 121-5, figs. 28-30.

probable that they actually come from rifled tombs at Tepe Giyan itself, for Contenau and Ghirshman say that when they first saw the *tell* it had been honeycombed by tomb-robbers.

The pots have therefore been catalogued in three groups, A-C, corresponding with the three levels of Contenau and Ghirshman's upper stratum, beginning with the lowest. These groups will henceforth be referred to as Tepe Giyan A, B, C.



PLATE I.

*Pottery.*

Group A (Pls. I, IA, figs. 1-7).

1. Ash. Mus. 1930. 456.

Large jar, smooth-surfaced, gritty ware with some mica dust, pinkish paste, wet-smoothed with buff; everted rim, concave neck, angular shoulder, globular body, concave base; linear decoration combined with a frieze of conventionalised birds in blackish-brown matt paint. H. 0.276m. G.D. 0.306m.

For the shape and decoration, compare Contenau and Ghirshman, p. 8, pl. III, 4; *BMQ* IV, pl. v b, and V, pl. ii; Frankfort, *ASP*, fig. 10; Contenau, *Manuel*, p. 646, fig. 450. For the decoration only, compare *MDP* XX, fig. 28, 6.

2. Ash. Mus. 1934. 40.

Small jar, smooth-surfaced, gritty ware, pinkish-brown paste, wet-smoothed with buff; everted rim, concave neck, angular shoulder, globular body, flat base; linear decoration in blackish-brown matt paint. H. 0.074m. G.D. 0.094m.

3. Ash. Mus. 1930. 458.

Small jar, ware as last, red paste, wet-smoothed with lighter red ; shape as last ; linear decoration in purplish-brown matt paint. H. 0.07m. G.D. 0.086m.

4. Ash. Mus. 1930. 457.

Small jar, ware as last, pinkish-brown paste, wet-smoothed with buff ; unevenly shaped and coarsely finished ; everted rim, concave neck, angular shoulder, globular body, rounded base ; linear decoration in blackish-brown matt paint. H. 0.10m. G.D. 0.106m.

For the shape and decoration of nos. 2-4, compare Contenau and Ghirshman, p. 8, pl. III, 1 ; *BMQ* VII, pl. xxviii a and c ; *MDP* XX, fig. 28, 5.

5. Ash. Mus. 1934. 38.

Large jar, rough-surfaced, gritty ware, pinkish paste, wet-smoothed with buff ; everted rim, concave neck, inverted-ovoid body, concave base ; linear decoration with cross-hatched, crenellated, and fish-bone pattern in blackish-brown matt paint ; in addition, two pairs of small blobs of clay added in relief on the neck before wet-smoothing. H. 0.21m. G.D. 0.226m.

For the shape and decoration, compare Contenau and Ghirshman, p. 8 ; *BMQ* IV, pl. v b.

6. Ash. Mus. 1930. 459.

Small, one-handled jar, ware, paste, and finish as last ; everted rim, concave neck, inverted-ovoid body with carination, rounded base ; linear decoration in blackish-brown matt paint. H. 0.078m. G.D. 0.088m.

For the shape, compare Contenau and Ghirshman, pl. III, 2 ; *BMQ* VII, pl. xxviii f. For the shape, but with a spout instead of a handle, compare *BMQ* III, pl. xxxix a 4 ; *MDP* XX, fig. 28, 3.

7. Ash. Mus. 1934. 42.

Small jar, smooth-surfaced, gritty ware, brown paste, wet-smoothed with buff ; everted rim, concave neck, sloping shoulder, inverted-ovoid body with carination, rounded base ; linear decoration in blackish-brown matt paint. H. 0.08m. G.D. 0.102m.

PLATE II.



Group B (Pls. II, IIA, figs. 8, 9).

8. Ash. Mus. 1934. 45.

Small, one-handled jar, smooth-surfaced, gritty ware, brown paste, colour-coated over the whole exterior and on the inside of the lip with dark, reddish-brown, the colour-coat afterwards burnished ; everted rim, concave neck, carinated, bulbous body, hand-finished from the carination downwards, uneven, slightly convex base ; linear decoration in black matt paint. H. 0.084m. G.D. 0.088m.

This dark red ware is discussed by Contenau and Ghirshman, p. 7. For the shape of this vase, compare *BMQ* VII, pl. xxviii, d. Similar shapes are illustrated in *BMQ* III, pl. xxxix, 2 ; *BMQ* IV, pl. v c 10.



9. Ash. Mus. 1934. 46.

Beaker on three feet, smooth-surfaced, gritty ware, brown paste, colour-coated over the whole exterior and on the inside of the lip with matt red; everted rim, concave-sided body, rounded base standing on three added feet; no decoration. H. 0.076m. G.D. 0.084m.

For the shape, but with small excrescent vases on the rim, compare Contenau and Ghirshman, pl. II, 4.



10



11



13



12



14



15



16

PLATE III.

Group C (Pls. III, IIIA, figs. 10-16).

10. Ash. Mus. 1934. 39.

Beaker, smooth-surfaced, gritty ware, pinkish-brown paste, wet-smoothed with buff; everted rim, concave-sided body, solid base-ring; linear and figured decoration in purple paint in two friezes, the upper consisting of groups of solid triangles, the lower of two panels containing three birds each, alternating with panels of cross-hatched lattice and solid triangles; the exterior, except the base, afterwards burnished. H. 0.122m. G.D. 0.098m.

For a similar shape, compare *BMQ IV*, pl. v c 9. For the decoration only, compare Contenau and Ghirshman, p. 7; Contenau, *Manuel*, p. 647, fig. 451.

11. Ash. Mus. 1934. 44.

Small jar, ware as last, brown paste, wet-smoothed with buff; everted rim, concave neck, carinated, oval body, solid base-ring; linear and figured decoration in faded purple paint in two friezes, the upper consisting of three crenellated panels with dot-rosettes, the lower of three panels each containing two birds and a dot-rosette, alternating with panels of cross-hatched lattice and fish-bone pattern; the exterior, except the base, afterwards burnished. H. 0.082m. G.D. 0.082m.

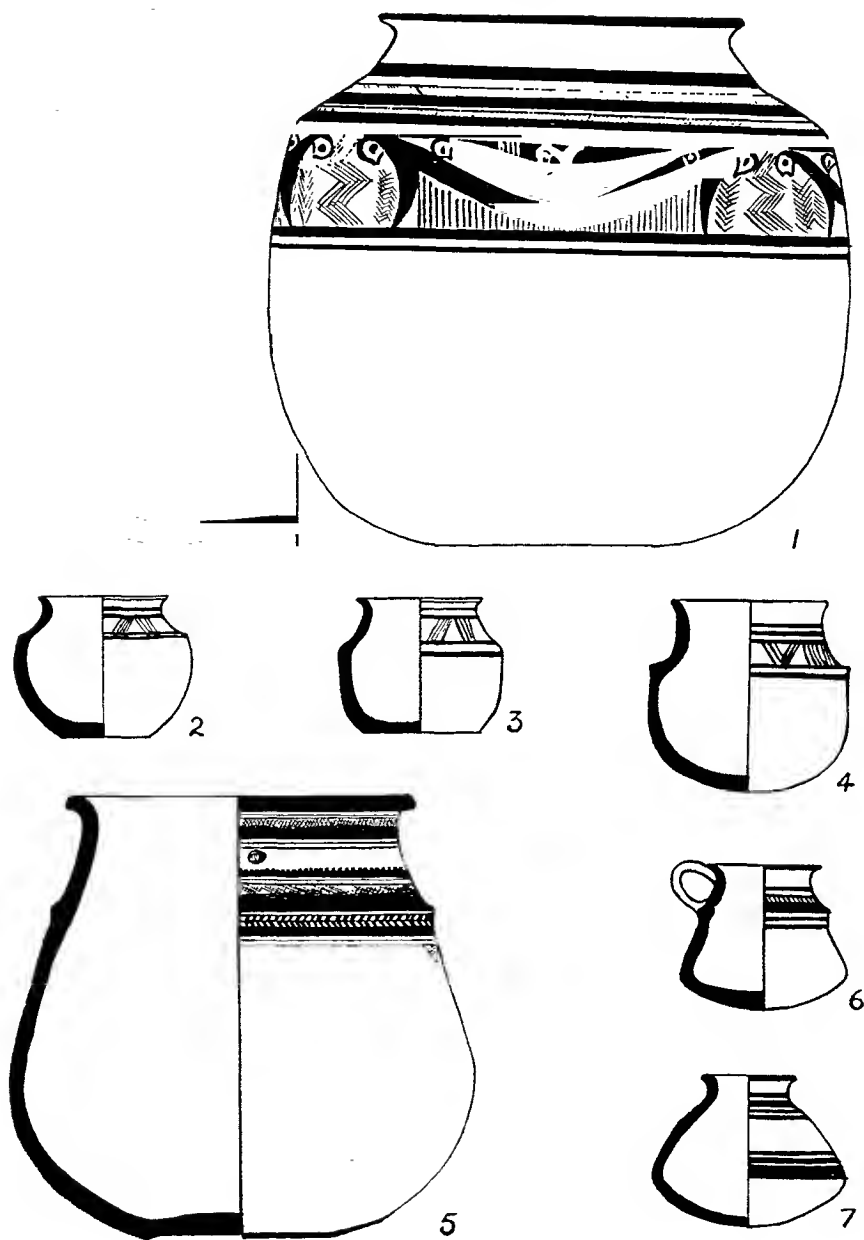


PLATE IA.

For the shape and decoration, compare *MDP* XX, fig. 30. For the decoration only, compare Contenau and Ghirshman, p. 7; Contenau, *Manuel*, p. 647, fig. 451.

12. Ash. Mus. 1934. 41.

Beaker, smooth-surfaced, gritty ware, pinkish paste, wet-smoothed with buff; everted rim, concave-sided body, flat base; linear decoration in faded blackish-brown matt paint with three friezes: (a) cross-hatched lattice, (b) alternating solid and cross-hatched lozenges. (c) groups of sloping lines alternately right and left. H. 0.074m. G.D. 0.08m.

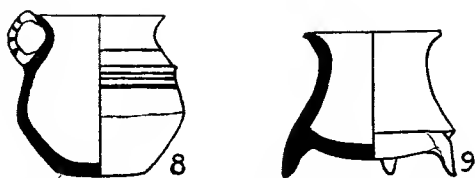
13. Ash. Mus. 1934. 43.

One-handed goblet, smooth-surfaced, straw-tempered ware, brownish paste,

wet-smoothed with buff; everted rim, concave neck, cylindrical body on a tapering stem, splayed foot slightly concave below; linear decoration in blackish-brown matt paint in two friezes of cross-hatched and diagonal-hatched panels and sloping ladders. H. 0.15m. G.D. 0.08m.

For a similar shape but without the upper carination, compare Contenau and Ghirshman, pl. II, 3; *BMQ* IV, pl. v c 8 and 14. For the same shape, but fatter and squatter, compare Contenau, *Manuel*, p. 647, fig. 451.

PLATE IIA.



14. Ash. Mus. 1934. 47.

One-handed jug; soft, fine ware, now flaking and decomposed, grey paste, burnished vertically on outside of neck and horizontally on outside of body and on inside of rim; concave neck, angular shoulder, convex body, solid base-ring, slightly concave below; no decoration. H. 0.078m. G.D. 0.072m.

This grey ware imitating metal is discussed by Contenau and Ghirshman, p. 7. For the shape and ware, compare *BMQ* VII, pl. xxviii e.

15. Ash. Mus. 1934. 49.

One-handed bowl with bridge-spout; soft, gritty, hand-made ware, brown paste, coated over whole of outside as well as on inside of lip with reddish-brown, which has afterwards been burnished; slightly concave neck, bulbous body, solid base-ring concave below; thumb-piece on handle and strengthening bridge across spout at rim; no decoration. H. 0.09m. G.D. 0.094m.

This brown-burnished ware imitating metal is discussed by Contenau and Ghirshman, p. 7.

16. Ash. Mus. 1934. 48.

One-handed bowl with channel-spout; soft, gritty ware, grey paste, burnished



PLATE IIIA.

over the whole of the outside except the under side of the base ; carinated body tapering towards neck and base, base flat ; handle with elaborate thumb-piece, channelled on top ; plain, hemicylindrical, channelled spout ; on the shoulder is a zigzag raised ridge with dots in the angles, carved out of the clay of the pot and not barbotined on. H. of bowl 0.064m. G.D. of bowl 0.074m.

This grey ware imitating metal is discussed by Contenau and Ghirshman, p. 7.

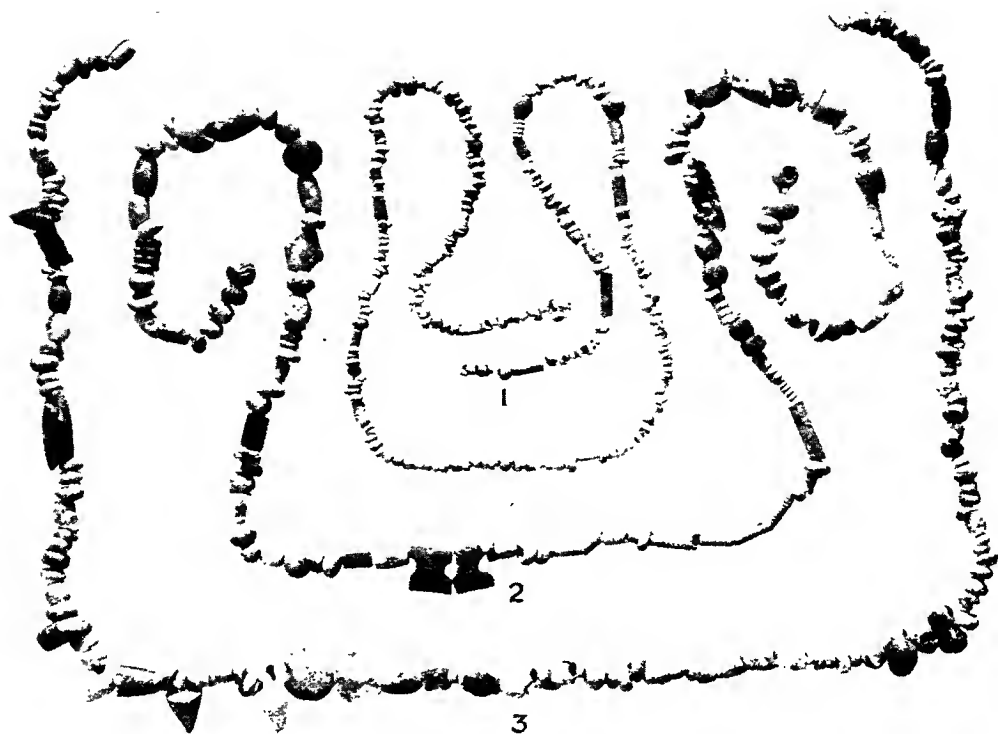


PLATE IV.

*Beads (Pl. IV).*

1. Ash. Mus. 1934. 50. String of beads, glass or faience, both materials originally yellow or white, but now weathered to a whitish or buff tone, often iridescent ; mostly irregular squat spherical, but a few plain or segmented cylinders, and barrels. Total length as strung 0.425m.

2. Ash. Mus. 1934. 51. String of beads, glass or faience, mostly as last string, but some of blue or green material and scarcely weathered ; the majority are irregular spherical or squat spherical, others are plain or segmented cylinders, barrels, small melons and lentoids ; in the centre are two flat spacers of turquoise-blue colour. Total length as strung 0.54m.

3. Ash. Mus. 1934. 52. String of beads, mostly glass or faience, but three stone and one bronze ; the glass and faience specimens were originally yellow or white and are now weathered to a white, buff or brown tone, the three stone beads are of banded yellow limestone, green steatite, and black and white diorite respectively ; the majority are irregular spherical, squat spherical, or barrels ; amongst other shapes are two lentoids, four conical pendants, and three knuckle-bones. Total length as strung 0.048m.

It will appear from a study of this catalogue that not only does the technique of dark-on-light linear decoration on pottery continue throughout the three levels, but that many of the decorative motives, e.g., crenellation and fish-bone lines, remain constant also, though shapes change. The appearance of red ware in group B and of hand-made grey and red burnished ware in group C did not cause the abandonment of the old dark-on-light painted technique and its decorative motives. Contenau and Ghirshman (*op. cit.*, p. 9) noted this phenomenon. It indicates, not so much that the three levels are nearly contemporary, but that N.W. Persia was a backward district where inventiveness in the matter of decoration and technique was not a marked characteristic of the potters. That the shapes changed while the decoration and technique remained in part constant is not to be wondered at, for in pot-making shape is usually flexible and subjective.

What of the date of this Nehavand pottery, and of its relation to wares from other Asiatic sites?

There is, of course, a general resemblance of the dark-on-light ware, with its linear and animal motives, to the Susan styles and their congeners, and Contenau and Ghirshman (*op. cit.*, p. 11) have claimed that level C is an overlap of Susa I and II styles, while levels B and A represent the developed Susa II. It would seem that there is some justification for this claim, though that is not to say that the contemporaneity of the respective Susan and Tepe Giyan levels is to be conceded. Before final judgment is passed, the full report of the Tepe Giyan excavations must lie before us.

At the same time grey and red hand-made or wheel-made burnished pottery like nos. 14-16 is well known in one form or other all over Mesopotamia and Persia, but as it occurs at different periods on different sites, its occurrence is a very unstable basis for arguments about chronology or kinship.

One site, however, that of Tepe Hissar (Damghan) near Teheran,<sup>1</sup> provides important parallels to our latest level, Tepe Giyan C, in its own latest level Hissar III, while at the same time it provides a parallel case of dark-on-light technique lasting on through its three levels, Hissar I-III, though invaded by the grey-ware techniques.

In Hissar I—the lowest stratum—<sup>2</sup> the typical fabric is a wheel-made ware with dark-on-light decoration of linear motives and conventionalised animals, akin in technique though not in shape or design to Tepe Giyan dark-on-light ware. In Hissar II<sup>3</sup> painted ware begins to be ousted by wheel-made grey ware, usually plain, but occasionally decorated with incisions or added knobs. Finally, in Hissar III,<sup>4</sup> though there are a few painted survivals, the chief fabric is a hand-made grey ware, plain, incised, or burnished. In this stratum parallels occur to the tripod-pot (no. 9) of Tepe Giyan B, and to the concave-sided beaker (no. 10) and the spouted pot (no. 15) of Tepe Giyan C.<sup>5</sup> A similar spout to that of no. 15 also occurs on silver and stone vessels of Hissar III.<sup>6</sup>

<sup>1</sup> E. Schmidt, "Tepe Hissar Excavations, 1931," *Museum Journal* XXIII (1933), pp. 322 ff.

<sup>2</sup> *Op. cit.*, pp. 344 ff.

<sup>3</sup> *Op. cit.*, pp. 367 ff.

<sup>4</sup> *Op. cit.*, pp. 392 ff.

<sup>5</sup> For examples of all three, see *op. cit.*, pl. cxvi.

<sup>6</sup> *Op. cit.*, pls. cxxv and cxxxix.

Thus a body of evidence has been accumulating which suggests an equation in time of Hissar III with Tepe Giyan C. The beads corroborate this. The only distinctive shape of bead common to two out of our three strings is the segmented cylinder. At Hissar a string containing many of these beads occurred in level III,<sup>1</sup> while such beads do not seem to have been found in earlier levels. Knowing that segmented beads have occurred in Mesopotamia as early as the Jemdet Nasr period,<sup>2</sup> we should hesitate to equate Hissar III and Tepe Giyan C on this evidence alone, but as it is borne out by pot-shapes and technique, we have surer ground for our judgment.

Can we go further and attempt to give an absolute date to the Tepe Giyan series?

The end of Hissar III was dated to *c.* 1500 B.C. by the excavators,<sup>3</sup> wholly because of the absence of iron in that stratum. The argument is slender. Contenau and Ghirshman<sup>4</sup> had firmer reasons for dating the latest Tepe Giyan level to just before 1000 B.C., because of the types of iron and bronze weapons found in the tombs. It is possible, therefore, that Hissar III should be brought down to the second half of the second millennium B.C., and that the absence of iron in it is merely fortuitous. But Contenau and Ghirshman have as yet made no attempt to give absolute dates to their earlier levels. Comparative evidence of well-dated material from other sites is wholly lacking, and in its absence any attempt at chronological exactitude can only be the merest guesswork.

D. B. HARDEN.

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<sup>1</sup> *Op. cit.*, p. 438, pl. cxlv.

<sup>2</sup> For one from Jemdet Nasr itself, see Mackay, *Jemdet Nasr* (*Field Museum Anthropol. Memoirs*, I, 3), pl. lxxii, 5.; now no. 1926.460 in the Ashmolean.

<sup>3</sup> *Op. cit.*, p. 390.

<sup>4</sup> *Op. cit.*, p. 10.

#### OSIRID STATUE OF AKHENATEN (on cover).

This remarkable Osirid statue of Akhenaten is one of the series recently discovered in the early temple of that monarch at Karnak. It is here reproduced by kind permission of the authorities of the Cairo Museum at the request of Mr. G. D. Hornblower, to whom acknowledgment is made.—(EDITORS.)

## THE BARNDOR FOWL IN EGYPTIAN ART.

THE spoon in the accompanying figure is of wood ; its length is  $8\frac{1}{2}$  inches, the length of the bowl  $3\frac{3}{4}$ , and its breadth  $1\frac{3}{4}$  inches. It was procured many years ago from a Cairo dealer and its age and provenance are unknown ; the bowl is delicately carved in a shapely oval as in known specimens dating from the New Kingdom. Many ancient spoons have survived, some of great beauty and extremely ingenious design, such as those in the British Museum which have been published by Miss Madeleine Frédrécq in the *Journal of Egyptian Archaeology*, XIII, 7, but the present example is remarkable for a rare feature, in the barndoor fowls carved at each end of the handle. Their identity is clearly shown by the port of the tail in the bird at the juncture of the handle with the bowl ; the upright carriage is characteristic of the domesticated strain, for the wild jungle-fowl from which the race has descended has a drooping tail (A. Newton in the *Enc. Brit.*, 11th ed., X, 760).



The bird which usually decorates the finials of spoon-handles is the duck ; the barndoor fowl here shown appears to be unique. The species was not introduced into Egypt till certainly the XVIIIth dynasty, if not later, as Dr. Howard Carter has shown in the *Journ. of Egyptian Archaeology*, IX, 1-4, where he relates in detail its story in the ancient Near East. Its late entry into Egypt accounts for its general absence as a decorative element in the country's art : the conventions for pictures of ordinary life were firmly fixed under the Old Kingdom and were strictly maintained for similar scenes in later periods by the religious conservatism so strong in Egypt. Therefore, though in Babylon, as Mr. Sidney Smith relates—quoted by Dr. Howard Carter in the above-mentioned article—the domesticated jungle-fowl had some religious significance,<sup>1</sup> in Egypt it was not admitted even as a decorative element in art, unlike the duck or the goose which figure largely in the revered works of the Old Kingdom and were accordingly admitted freely into later art.

G. D. HORNBLOWER.

<sup>1</sup> In India, in the early part of the 3rd millenium B.C., it is very probable, though not yet certain, that the jungle-fowl was domesticated ; see E. Mackay, *Mohenjo-daro and the Indus Civilisation*, pp. 323, 392, 662 and 669.

## THE STATISTICAL TREATMENT OF ANCIENT WEIGHTS.

1. In the study of the systems of weights used by the peoples of antiquity investigators are at once confronted with the difficulty that the values found are extremely variable.

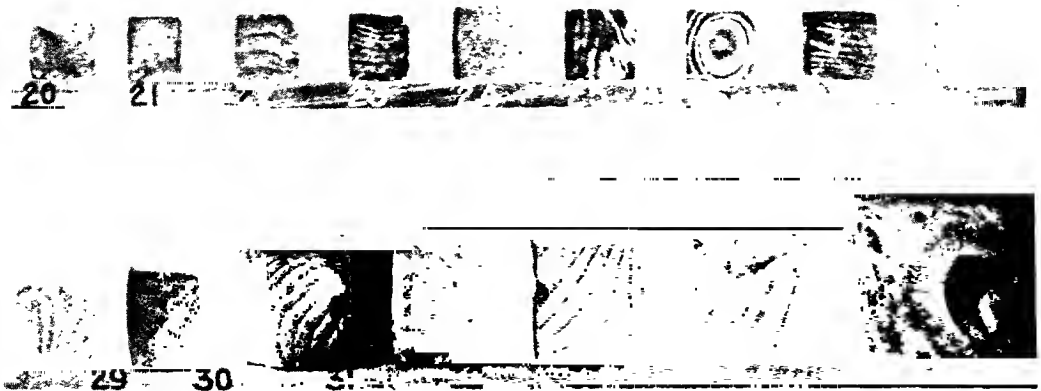
One cause of this is that the weights may no longer have their original values ; there are the wear and tear of use, accidental damage and the loss due to chemical corrosion.

The change due to the second cause is at once apparent to the eye. Where the original form was geometrical, the original weight may sometimes be recalculated. The change due to the third is usually inappreciable when the material used is a hard stone, and fortunately this material was used in the majority of cases. Crystals occur in perfect condition in rocks millions of years old ; the few thousands of years archaeologists have to deal with produce a negligible effect where the conditions are reasonably favourable.

Losses due to wear and tear become most appreciable for the smaller weights. Taking the cubical chert weights common in the Indus system, a wear of the edges equivalent to a bevel of  $\cdot 5$  mm., not very noticeable, in the case of a cube of 2 cm. side would not affect the accuracy by  $\cdot 5$  per cent., but would, for a cube of 1 cm., weighing between 2 and 3 grammes, produce an error of about 1.5 per cent.—a quite important amount, for the greatest permissible error should not exceed  $\cdot 5$  per cent.

In recording specimens, it is most desirable to indicate the condition of the weights in such a manner that weights outside the above-mentioned limits of accuracy may be set aside. It cannot be said that this precaution has been very generally practised. In many cases, also, the observer has not made the weighing to the above degree of accuracy, and the record is only in round numbers. This makes it difficult to decide whether to accept or reject an observation in integral figures, particularly when ciphers have been added, giving a false appearance of precision although the frequency of recurrence of that particular value is far in excess of probability.

2. In consequence of the great variability of the weights found, there has been a tendency among metrologists to select as standard some particular weight



CHERT WEIGHTS FROM MOHENJO-DARO.  
(By Courtesy of Arthur Probsthain)

11 approx





made, but, whatever the suggestions, it is clear that there is a wide latitude of variation. The same may be said of any collection of ancient weights. It is evident that, even if these early dealers attached importance to accuracy, they were incapable of attaining it. More time was spent on obtaining perfection of form than of dimensions. Art took precedence of science in those days.

Under such circumstances, it is a fruitless task to search for some particular weight which can be accepted as a general standard. The most we can hope to discover is at what values some considerable body of weight-makers were aiming. A method of investigation is therefore needed which, as far as possible, frees us from the necessity of making personal judgments of preference for one weight rather than another.

3. It is obvious that the balances of the weightmakers were rough, so that their copies were only approximations to the standard they used. If these standards were copies of other standards, and the process of copying were sufficiently repeated, in time the range of variation would be very considerable. The variations, when not deliberate, would be fortuitous and the result of the addition of many errors, positive and negative values being equally likely. If the individual errors were small, the probability of an error of given amount will follow the mathematical Law of Errors, which states that the Probability  $y$  of an error equal to  $x$  is given by the equation  $y = ke^{-h^2x^2}$ , where  $e$  is the base of Napierian logarithms,  $k$  is the value of the maximum ordinate, and  $h$  is a constant called the Measure of Precision. The more accurate the collection of weights, the larger is  $h$  and the sharper the curve.

To apply this law in practice with any hope of accuracy, large numbers of specimens are essential, otherwise the theoretical shape of the resulting curve is masked by accidental groupings. Unless the numbers run to hundreds, the method can tell us little, but when such numbers are available, we may place considerable reliance upon any conclusions which may be drawn.

4. In any large collection of weights, of course certain specimens will be by intention multiples of others belonging to the same system. The value of the multiple is generally quite obvious, but owing to the gross inaccuracy of some of the specimens, there will be borderline cases, especially amongst the smaller weights. Large numbers, however, reduce the importance of an error due to a wrong attribution.

If the variation of the weights is fortuitous, the mean deviation of the specimens intended to have the same value will be proportional to the mean value. If also the balances used give a uniform percentage accuracy throughout their range, and we plot a curve showing the number of specimens within a given range of value as ordinate and the logarithm of the value as abscissa for the whole range of the weights of a system, we should get a number of peaks of the same degree of sharpness.

In fig. 1 are plotted all the weights found belonging to the Indus system up to a value of 550 gm. These weights were divided into a series of steps for which the logarithms of the values are within a range of .025. The ordinate is the number of specimens within this range corresponding to an abscissa which is the logarithm of the weight of the middle point of the range. The range extends to about 3 per cent. on either side of the weight of the middle point.

Most of the peaks in fig. 1 are very nearly equally sharp, except, as might be expected, for the smaller groups, where the balances have shown themselves less accurate. In the figure the ratios adopted have been marked.

5. If we divide the value of each specimen by its ratio to the standard

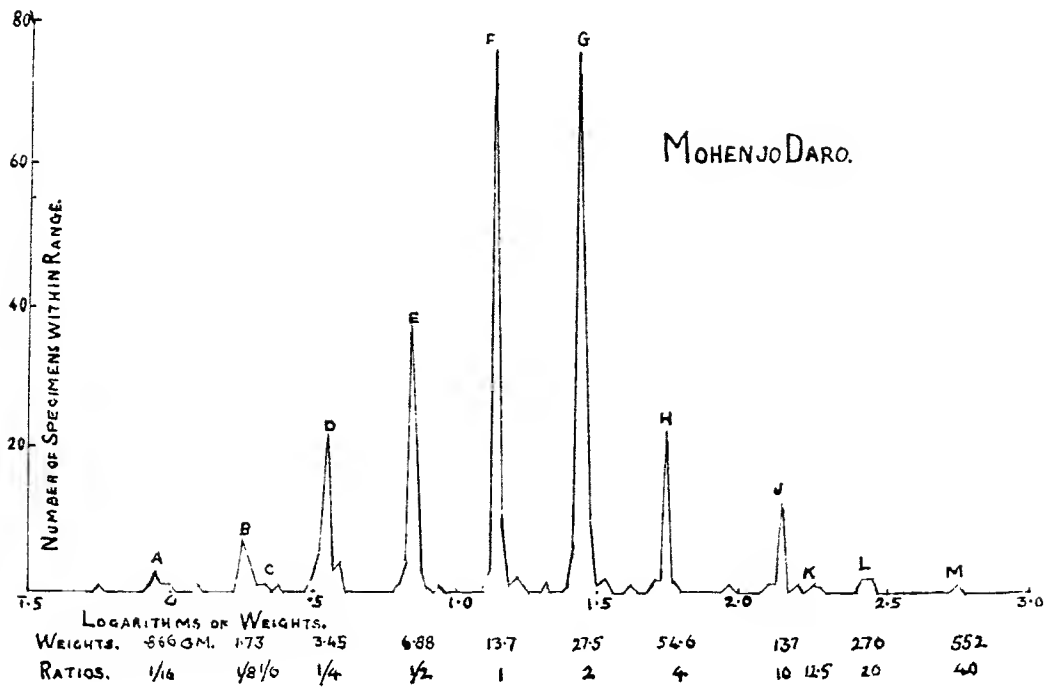


FIG. 1. FREQUENCY OF WEIGHTS IN THE INDUS SYSTEM.

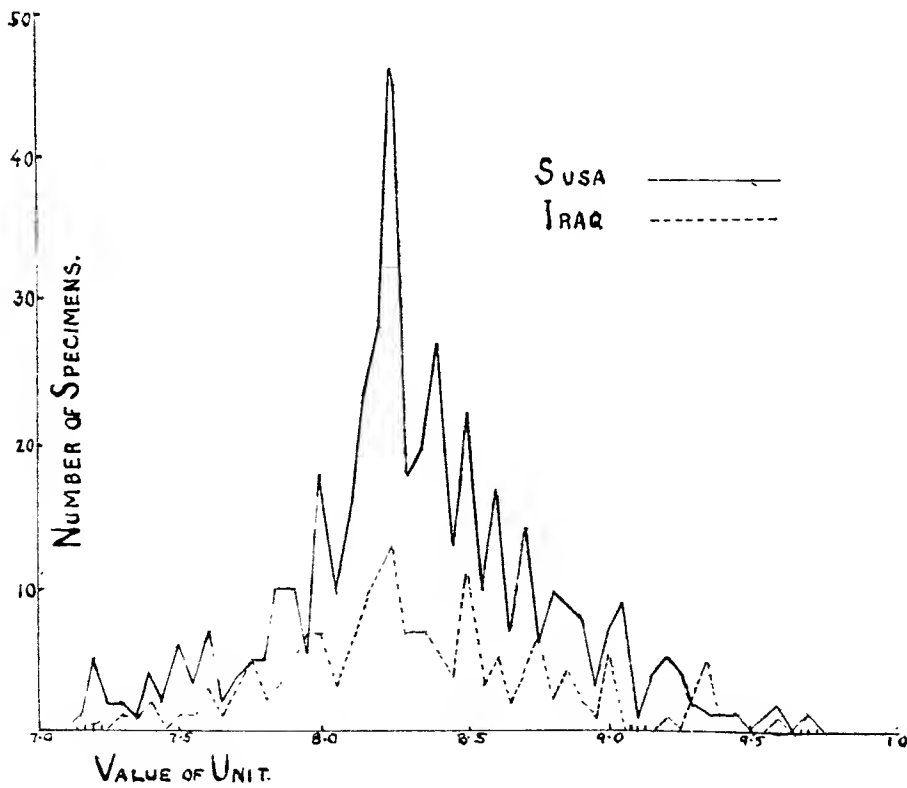


FIG. 2 DISTRIBUTION OF VALUES OF THE UNIT AT SUSA AND IRAQ.

adopted, we get the value of that unit derived from this specimen ; these show considerable variation. We may plot a curve with the mean of a certain small range of values of the unit as abscissa and the number of specimens within that range as ordinate. Fig. 2 shows such a curve for the weights of Susa. If there is only one standard and the variations are fortuitous, then for an infinite number of specimens, the resulting curve will be the Probability Curve. If some of the weights conform to one standard and others to another, the ordinates of the curve will be the sum of the ordinates of two probability curves, one for each standard. Figures 3 and 4 have been obtained in this way. The number of specimens conforming to a given standard will be proportional to the area of the corresponding curve.

With a finite number of specimens, chance deviations will occur. The amount of the deviation will be according to the degree of inaccuracy of the system and proportionately most marked for small values of the ordinates. Where only a very small percentage of the total weights appear to conform to a certain standard, the chances are that they are merely an accidental grouping, which would disappear with an increase of data.

6. The investigation of the weights of the Indus system, found mainly at Mohenjo-daro in Sind, but also at Harappā in the Punjāb, some 500 miles to the north, has revealed a system in which it is obvious that all but a very few specimens conformed to a single standard.

Fig. 1 records without exception all the specimens up to 550 gm. in sufficiently good condition to be taken into account. The specimens range actually up to 11,467 gm., but as only 10 have weights above 550 gm., and these are not exceptional, it is unnecessary to extend the diagram. The extremely sharp maxima show that the system has an accuracy far in advance of what is to be found elsewhere at so early a period, which is probably between 3000 and 2500 B.C., or for that matter long after. The maximum at F, corresponding to a mean weight of 13.71 gm. (211.57 gr.), may be conveniently taken as the unit. The maxima at A, B, D, E, F, G, H, and J correspond to ratios to the unit of  $\frac{1}{16}$ ,  $\frac{1}{8}$ ,  $\frac{1}{4}$ ,  $\frac{1}{2}$ , 1, 2, 4 and 10 respectively. The number of specimens corresponding to the maxima at K, L, and M are small, but there can be no doubt that the maxima have ratios 12.5 (200 A), 20 and 40. The higher ratios not shown which occur are 100, 200, 400, 500, and 800. The reality of the C group with a ratio of  $\frac{1}{6}$  is more doubtful. The investigation of the first data provided gave 2 specimens separated from Group B best accounted for by this ratio. Although subsequently the number of specimens has been more than doubled and Group B has spread upwards, Group C has not increased. Its reality must be considered provisional.

Accepting these ratios, values of the unit were obtained by dividing each weight by its ratio. A table may be constructed showing the number of specimens conforming to a unit within a range of .025 gm. on each side of the mean value of the range. We get a series of steps of .05 gm. In fig. 3 the results are plotted as small circles on a diagram in which the mean unit of the range is abscissa and the number of specimens in the range is ordinate. The results are irregular, though not nearly so much as in fig. 4, which gives similarly the results from Sumer. To compensate for the number of specimens not being infinite, a smoothing process has been adopted. If  $a$ ,  $b$ , and  $c$  are successive values of the number of specimens, we replace  $b$  by the formula  $(a+2b+c)/4$ . The results are plotted as crosses in fig. 3. 12 results out of 360 below 12.75 and 13 above 15.0 have been omitted from consideration. These show no tendency to form groups, but are irregularly scattered.

By a process of trial and error, a number of probability curves have been found of which the sum of the ordinates gives a curve (the continuous curve of the figure) which the figure shows fits the smoothed observations as well as can be expected.

The data of these probability curves (fig. 3) are as follows:—

C (— · — · —) Mean value = 13.625 gm. (210.2 gr.).

Maximum ordinate ( $k$ ) = 12.

Measure of precision ( $h$ ) = 2.875.

F (— · — · —) Mean value = 13.625 gm. (210.2 gr.).

$k = 28$

$h = 8.865$ .

A (.....) Mean value = 13.95 gm. (215.2 gr.).

$k = 3.75$

$h = 8.316$ .

B (— — —) Mean value = 14.375 gm. (221.7 gr.).

$k = 4$

$h = 5.364$ .

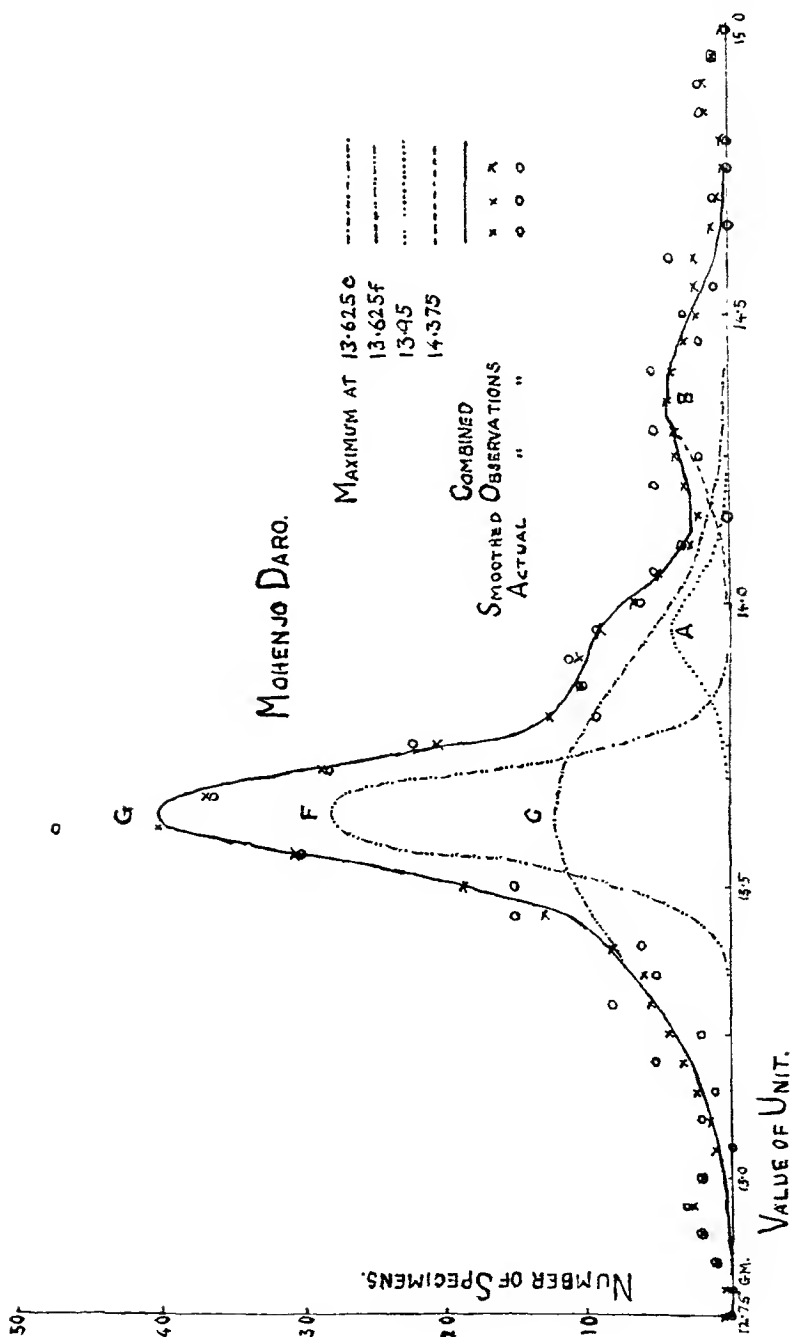


FIG. 3. DISTRIBUTION OF UNIT IN THE INDUS SYSTEM.

The ordinates of the continuous curve D are obtained by adding the values of the calculated ordinates of the above four curves.

Where the value of the ordinate is small, its uncertainty is proportionally large, so that the form of the curve above 14.1 is doubtful. The position of the maximum given as at 14.375 is therefore somewhat uncertain and may be a trifle higher.

The number of specimens corresponding to each curve is proportional to the area of the curve. As the observations have been smoothed, however, the percentages found must be taken as rough approximations only. We arrive, therefore, at the following conclusions: in the Indus system, the great majority (86 per cent.) of the specimens conform to a standard of 13.625 gm. These can be divided into an accurate group with 35 per cent., and one much less so with 49 per cent. There are a few (5 per cent. conforming to a standard of 13.95 gm., and another small (9 per cent.) and inaccurate group with a standard of about 14.375 gm. These results may be considered to confirm amply the hypothesis that in the Indus system the distribution of the values of the weights is due to fortuitous variation about a few standards and so is amenable to mathematical treatment.

7. Let us now apply the method to the consideration of weights coming within the area under Sumerian influence. Unfortunately here the data available are not so satisfactory. There appears to be a great lack of uniformity in the accuracy of the determination of the weights and in the record of their condition. The frequency of round numbers is far beyond what probability would assign, so that the invidious task of censoring them has to be undertaken. Again, whereas in India there is a reasonable assurance that no specimen has been accepted of which the uncertainty of the weight exceeds 0.5 per cent., no such assurance is possible with the Sumerian data.

Moreover, except in the case of Susa, the data available is comparatively meagre, insufficient for statistical treatment. The question of the inclusion of Susa with Sumer proper was decided by a comparison of the unsmoothed curve of the distribution of the unit for Susa on the one hand, and the data obtained from all places within the area of present-day Iraq from Nineveh to Ur. The comparison is plotted in fig. 2. The general resemblance of the two curves shows that there is no reason for excluding Susa from the others. It has therefore been included.

The data for places using the Sumerian system have all been treated in the manner described above and the results are plotted in fig. 4.

The continuous curve G is obtained by summing the ordinates of the following six probability curves:

A (— . . — . .)	Mean value=7.575 gm.	(116.9 gr.).		
			Maximum ordinate ( $k$ )=6.	
			Measure of precision ( $h$ )=3.700.	
C (.....)	Mean value=8.225 gm.	(126.9 gr.).	$k=25.6$	$h=2.827$ .
F (- . . - . -)	Mean value=8.225 gm.	(126.9 gr.).	$k=16.0$	$h=13.60$ .
B (— . . — . .)	Mean value=8.45 gm.	(130.4 gr.).	$k=7$	$h=8.254$ .
D (- - - -)	Mean value=8.775 gm.	(135.4 gr.).	$k=11$	$h=3.146$ .
E (- . . - . -)	Mean value=9.25 gm.	(142.7 gr.).	$k=4.5$	$h=3.653$ .

The observed number of specimens for each value of the unit, marked in the figure by small circles, is smoothed as before by the formula  $(a+2b+c)/4$ . These results are marked as crosses. The agreement between the smoothed observed values and the theoretical is satisfactory, as the figure shows.

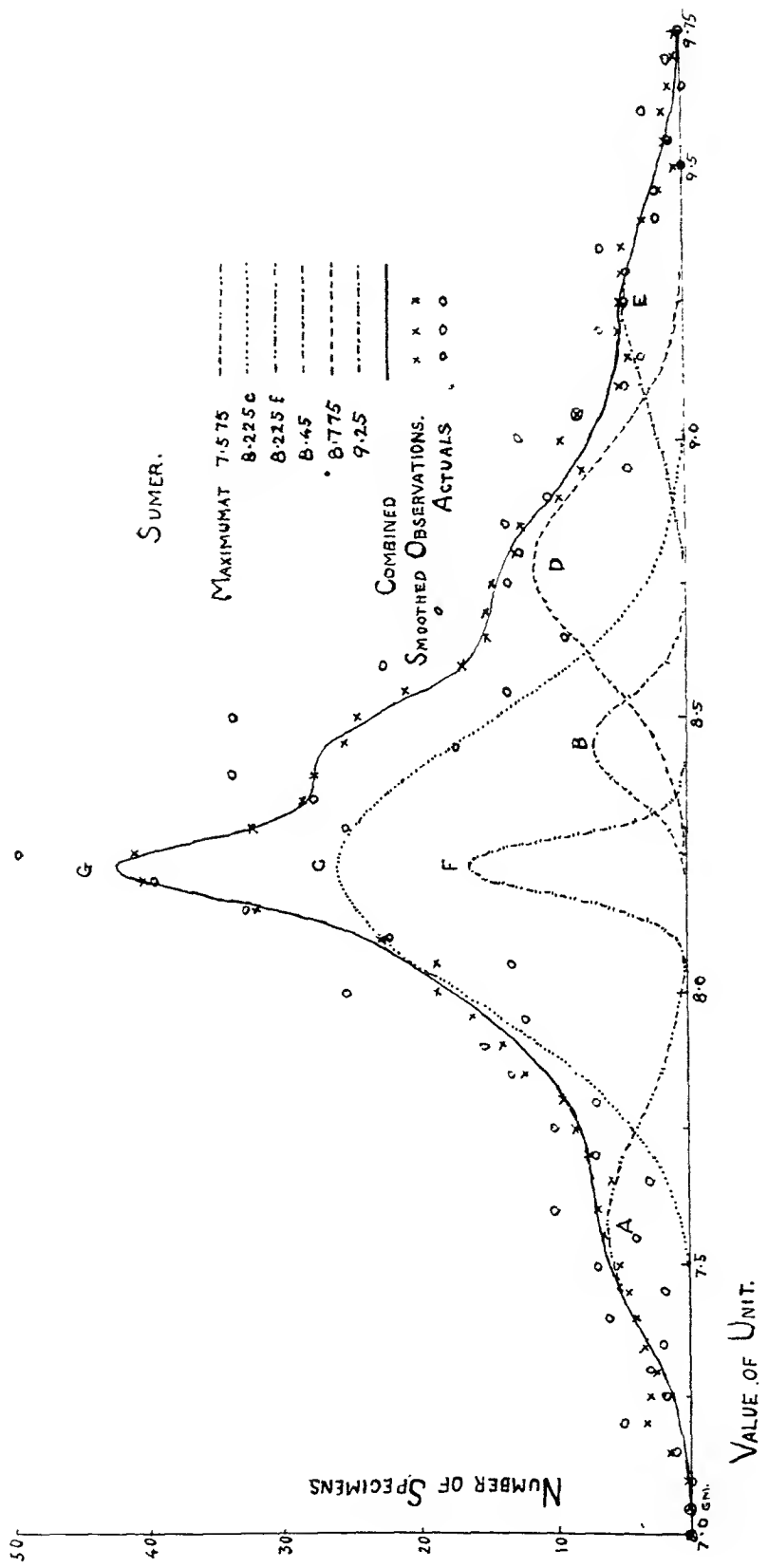


FIG. 4. DISTRIBUTION OF UNIT IN THE SUMERIAN SYSTEM.

We come, therefore, to the following conclusions, which, however, must be considered provisional until a larger body of more uniform data is available. The bulk of the weights (54 per cent.) form a very inaccurate series with standard 8.225 gm. Another 7 per cent. conform to the same standard with a high degree of accuracy; 10 per cent. give an inaccurate series with standard 7.575 gm.; 5 per cent. an accurate series with standard 8.45 gm.; 17 per cent. an inaccurate series with standard 8.775 gm.; and 7 per cent. an inaccurate series with standard 9.25 gm.

These conclusions are arrived at by consideration of weight of numbers, individual errors in attribution will be lost in the total result.

The standards at 8.225 and 8.45 gm., for which the corresponding *minas* are 493.5 and 507.0 gm., are the two values of the shekel generally recognised though with slightly different values. Col. Belaiew suggests that there are three *minas*:  $D_1=491.14$  gm.,  $D_2=502.7$  gm., and  $D_3=511.20$  gm. Whilst a more discriminating selection of the specimens utilised might lead to some alteration in the positions of the maxima, the form of the curve lends no support to this division into three.

Of the other standards present, that of 7.575 gm. comes within the range of the Egyptian *peyem*. The analysis will not distinguish between this attribution and the *su*, regarded by Col. Belaiew as a unit of value 30.71 gm., equal to 4 *peyems*. The only evidence to distinguish between these two standards would be the identification marks found on a few weights. The following are relevant: 232.5 gm. marked "half *mina* silver," 75.90 gm. with 10 strokes, 38 gm. with 6 strokes, 7.73 gm. with 2 strokes, 7.49 gm. with the same number, .95 gm. marked  $22\frac{1}{2}$  *se*. The first two clearly point to a standard of about 7.5 gm., the last, assuming the shekel to be equal to 180 *se*, gives the same standard. The 6 strokes of the weight 38 gm. might mean a unit of 6.33, but more probably it implies one sixth of a half *mina*, corresponding to a unit of 7.5 gm. The two weights with two strokes are ambiguous, but in any case do not point to a standard of 30.7 gm.

The standard at 8.775 gm., corresponding to a *mina* of 526.5 gm., comes within the range of what was later the *stater*, but found in Egypt contemporaneously.

Lastly, we have the maximum at 9.25 gm. Only two specimens in the neighbourhood of that standard are marked: 184.35 gm. and 2.30 gm., each marked with four strokes. We must assume that the former is four times the 5 shekel weight and the latter a quarter of a shekel. This is evidence that there is an actual standard in that neighbourhood.

We can now consider the attribution by Col. Belaiew of 40 out of 426 specimens, found since 1926 at Susa, to the Indus System.<sup>1</sup>

The frequencies of occurrence of the different groups as assigned by Col. Belaiew are quite different from those found in India itself. Giving the latter in brackets after Belaiew's numbers, we get the following figures: A 2 (5), B 5 (13), C 11 (2), D 7 (31), E 3 (45), F 1 (91), G 0 (94), H 0 (23), J 0 (11), K 1 (1), 2 K 1 (0), 3 K 1 (0), L 2 (4), M 1 (1), N 1 (3), V (ratio 200) 1 (3), W (ratio 400) 1 (1), X (ratio 500) 0 (1), Y (ratio 800) 0 (2).

The most common group at Susa is C with 11 specimens, and only 2 out of 360 have been found at Mohenjo-daro; the groups 2 K and 3 K, which Col.

<sup>1</sup> *Mémoires de la Mission archéologique de Perse*. Vol. XXV, p. 134. 1934.



Belaiew assumes, are not found at the type site. On the other hand, of groups F and G, which account for half of all the specimens found in India, only one representative is found at Susa.

The mean value of these 40 weights is 13.52 gm., which coincides neither with the mean value of the Indian weights (13.71), nor with any of the standards found there : 13.62, 13.95 and 14.37.

The mean deviation of the Susian unit is .40, which shows there is no tendency towards a standard value, but that the units are scattered irregularly between the limits 14.94 and 12.45.

If the Indus system is present at Susa, we should expect to find in the curve of fig. 4 a maximum at  $\frac{4}{6}$ ths of 13.625 gm., *i.e.*, at 9.1 gm. Actually this is near a minimum. It is true that the differences between the theoretical and actual values at 9.0 and 9.05 are larger than elsewhere, but this may be partly accounted for by the tendency for observations to be recorded in round numbers. We may, however, consider in detail the 27 specimens in Sumer for which the units assigned lie between 8.98 and 9.15. Five of these are given the value 4.50 and another 2.25 gm., round figures. Four bear marks indicative of value : (1) 35.90 gm. marked 2 shekels (this is from Nineveh and the unit is the Assyrian double shekel) ; (2) 538 gm. marked one *mina* ; (3) 540 gm. with 6 strokes indicating 6 times 10 shekels ; (4) 2.25 gm. with 4 strokes indicating one quarter of a shekel.

The evidence is entirely in favour of supposing that such agreements as occur are due to chance coincidence.

The conclusions arrived at in respect to the standards prevalent in Sumer would be more decisive if there were greater assurance that all weights had been recorded correctly to within one half per cent., and that the data all belonged to one locality and period. The only single place for which there is sufficient data is Susa. Considering the weights at that place alone, the curve is more irregular, but the only noticeable difference from the form of fig. 4 is that the maximum at 8.775 is displaced slightly, 8.825 giving a better result.

8. The conclusions given above may be summarised as follows :

1. The only standards which can be distinguished are those a considerable group of weightmakers are aiming at. Neither the artistic finish nor the fact that the specimen bears an authoritative inscription can be accepted as an indication of the accuracy of the specimen.

2. The variation in ancient weights aiming at a particular standard may be of large range and conforms to the Law of Errors.

3. The determination of the constants of the equation of that law requires a large number of specimens, a matter of hundreds. The theoretical curve is then found to approximate closely to the observations.

4. The weighings need to be made to a uniform standard of accuracy, and the condition of the specimen definitely recorded, so that we may feel assured that we know the original weight to at least one half per cent. ; otherwise there will be a tendency for certain values to be favoured.

5. The maxima are determined from observations of a large number of weights, so that errors of judgment of individual specimens have a very minor effect upon the conclusions.

6. The coincidence in value of the weight of an individual specimen with the standard of another country cannot be taken by itself as evidence that the particular specimen is an example of that standard.

7. In particular, the coincidence in weight of certain specimens from Susa with weights belonging to the Indus system is not sufficiently marked to make it probable that they may be attributed to that system.

8. In the Indus system, the great majority conform to one standard (13.625 gm. or 210.2 gr.), and may be divided into two grades, one very accurate, one much less so. A small percentage conform to a standard of 13.95 gm. (215.2 gr.) and another very inaccurately to a standard of 14.375 gm. (221.7 gr.).

9. Considering all the weights within the Sumerian orbit, we find a similar state of things: a majority divided into two grades of differing accuracy conforming to the standard 8.225 gm. (126.9 gr.), a minority to three other slightly higher standards (8.45, 8.775 and 9.25 gm. or 130.4, 135.4 and 142.7 gr. respectively, the last being very inaccurate), and one to a lower standard, 7.575 gm. (116.9 gr.). The accuracy of these weights is distinctly less than we find in the Indus system.

No greatly different conclusions would be obtained if we confined ourselves to the specimens from Susa separately.

A. S. HEMMY

*(See also the forthcoming Supplement to this number.)*

## ARCHAEOLOGICAL EXPEDITIONS TO THE NEAR EAST AND ASIA.

SEASON 1935-6.

IN recent years the contacts and connections between the ancient civilisations have been recognised to be of paramount importance. Exact knowledge as to the excavations actually in progress, or contemplated for the near future, is in consequence an increasingly felt necessity; but information on this subject is often difficult to obtain. The editors therefore hope that this list will be of service to readers of this Journal, though it is unavoidably incomplete and it has not been possible to verify certain details. At the same time they wish to thank the authorities of the various countries who have so kindly supplied the information from which it has mainly been compiled.

SITE.	NAME OF EXPEDITION.	FIELD DIRECTOR.
<i>EGYPT.</i>		
1. (a) Valley of the Tombs of the Queens.	Royal Museum, Turin	Prof. G. Farina.
(b) Gebelein.		
2. Kom Achmounein	Pelizaeus Museum, Hildesheim.	Prof. Roeder.
3. Medinet Habu	Oriental Institute, Chicago	Prof. H. Nelson.
4. (a) Abu Ghalib	Egyptian Museum, Stockholm.	Prof. H. Larsen.
(b) Maassarrah.		
5. Antinoë (Sheikh-Ebada)	Society for Papyrological Research, Italy.	Senator Vitelli.
6. Pyramids of Gizeh	Harvard-Boston Universities	Dr. G. Reisner.
7. (a) Pyramids of Gizeh	Faculty of Arts of the	Prof. Selim Hassan.
(b) Tounah el-Gebel.	Egyptian University.	S. Gabra.
(c) Meadi.		Prof. Menghin.

SITE.	NAME OF EXPEDITION.	FIELD DIRECTOR.
8. (a) Great Pyramid . (b) Gebel Merimda.	Academy of Sciences, Vienna	Prof. H. Junker.
9. Tell el-Amarna .	Egypt Exploration Society	J. D. S. Pendlebury.
10. Armant .	Robert Mond Expedition of the Egypt Exploration Society.	O. H. Myers.
11. (a) Medamoud . (b) Toud.	Louvre, Paris .	M. Ch. Boreux.
12. (a) Khargeh O a s i s (b) Baharieh.	Royal Anthropological Institute. (No excavations this season.)	Miss G. Caton- Thompson.
13. Kom Om el-Boreigat .	Italian Archaeological Mission.	Dr. G. Bagnani.
14. (a) Assassif, Thebes . (b) Hierakonpolis.	Metropolitan Museum of Art, New York.	A. Lansing.
15. Kom Medinet-Madi .	University of Milan .	Prof. Vogliano.
16. Sinai, Rafah to El- Arish.	British School of Archaeology in Egypt.	Prof. Sir Flinders Petrie.
17. Deir el-Medineh, Thebes	French Institute of Oriental Archaeology.	M. P. Jouguet.
18. Tanis .	Ministry of Public Instruc- tion, France.	M. P. Montet.

*NUBIA.*

Kawa (Gem-Aton), Dongola Province.	Oxford University .	L. P. Kirwan.
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*PALESTINE.*

1. Megiddo (Tell el- Mutasallim).	Oriental Institute, Chicago .	Dr. Gordon Loud.
2. Et-Tell .	Louvre, Paris .	Mme Krause- Marquet.
3. Jisr Benat Yakub .	Hebrew University, Jerusalem.	M. Stekelis.
4. Athlit .	British School of Archaeo- logy in Jerusalem.	Miss D. A. E. Garrod.
5. Esbeita .	Colt Expedition of the British School of Archaeology in Jerusalem.	H. D. Colt.
6. Jebel Kafzeh, near Nazareth.	Institut de Paléontologie Humaine, Paris.	M. R. Neuville.
7. Bethlehem .	Wellcome Archaeological Research Expedition to the Near East.	Miss E. W. Gardner.
8 Tell Duweir .	„	J. L. Starkey.
9 Tell Keisan .	Neilson Expedition of the Institute of Archaeology, Liverpool.	Prof. J. Garstang.
10. Jericho .	Jericho Expedition of the Institute of Archaeology, Liverpool.	Prof. J. Garstang.

SITE.	NAME OF EXPEDITION.	FIELD DIRECTOR.
11. Tell el-Ajjul . . .	British School of Archaeology in Egypt.	Dr. M. A. Murray.

*TRANSJORDANIA.*

(?), Dolmen field . . .	British School of Archaeology in Iraq.	P. L. O. Guy.
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*SYRIA.*

1. Ras Shamra, Minet el-beida.	Louvre, Paris . . . .	Prof. C. Schaeffer.
2. Mari (Tell Hariri) . . .	Louvre, Paris . . . .	M. A. Parrot.
3. Dura (Doura-Europos)	Yale University, U.S.A. . .	M. Brown.
4. Apamea . . . . .	Royal Museums of Art and History, Brussels.	M. F. Mayence.
5. Hama (Hamath) . . .	Ny Carlsberg Glyptotek, Copenhagen.	H. Ingholt.
6. Chatal Huyuk, Tell Jedeideh, Tell Teinat.	Oriental Institute, Chicago .	Dr. C. W. MacEwan.
7. Antioch and its vicinity	Baltimore Museum of Art, National Museums of France, Princeton Univer- sity, Worcester Art Museum.	M. Campbell.
8. Tell Chagar Bazar . .	British Museum and British School of Archaeology in Iraq.	M. E. L. Mallowan.
9. Bosra . . . . .	British School of Archaeology in Jerusalem.	J. W. Crowfoot.
10. Tells near Antioch . .	British Museum . . . . .	Sir C. L. Woolley.
11. Byblos . . . . .	Service des Antiquités . .	M. Dunand.
12. Palmyra . . . . .	Service des Antiquités . .	M. H. Seyrig.
13. St. Siméon le Petit . .	Académie des Inscriptions et Belles-Lettres, France, and Antioch Museum.	R. P. Mercierian.
14. Palmyra District . . .	Académie des Inscriptions et Belles-Lettres, France.	M. D. Schlumberger.

*TURKEY.*

Istanbul (Ancient Palace of the Emperors).	David Russell Expedition of St. Andrews University.	Prof. G. H. Baxter.
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*U.S.S.R.*

Altai Mts. (burial grounds)	State Museum of History, Moscow.	
Kostenki, Voronezh Province.		Prof. N. Y. Efimenko.
(Other information promised, but not to hand at time of going to press.)		

*IRAQ.*

1. Tepe Gawra . . . . .	Museum of University of Pennsylvania, American School of Oriental Research.	C. Bache.
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SITE.	NAME OF EXPEDITION.	FIELD DIRECTOR.
2. Tell Asmar, Khafaje, Ishchali.	Oriental Institute, Chicago .	Dr. H. Frankfort.
3. Warka . . .	Die Notgemeinschaft der Deutschen Wissenschaft.	Dr. Nöldeke.
4. Kasr Shemamok .	Missione Archaeologica Italiana, (?)	Professor G. Furlani.

#### IRAN.

1. Persepolis (Takht-e Djamshid and Istakhr).	Oriental Institute, Chicago .	Dr. E. Schmidt.
2. Raiy (Raghès) . . .	University of Philadelphia, Boston Museum of Fine Arts.	Dr. E. Schmidt.
3. Susa . . . .	French Government . . .	R. de Mecquenem.
4. Shapur . . . .	Louvre, Paris . . . .	R. Ghirshman.
5. Archaeological research between Shiraz and Kurdistan:	Sir Aurel Stein.	
6. Luristan (Valley of Rumishgan).	American Institute for Persian Art and Archaeology.	Dr. E. Schmidt.
7. Nishapur . . . .	Metropolitan Museum of New York.	J. Upton.

#### INDIA.

Chanhu-daro, Indus valley (Sind).	American School of Indic and Iranian Studies, Boston Museum of Fine Arts.	Dr. E. Mackay.
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#### SIAM.

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Gaekwar of Baroda Greater India Research Expedition. Dr. Quaritch Wales.

#### CAMBODIA.

No information.

#### DUTCH EAST INDIES.

None.

#### CHINA.

Hanchow . . . .	West China Border Research Society, West China Union University.	
Various sites in Honan and Shantung.	Academia Sinica, Nanking .	Dr. Lichih.

#### JAPAN.

No information.

## THE FUTURE OF ARCHAEOLOGY.

THE prospect of learning the history of man from his works, which seemed so bright in anticipation a generation ago, has been clouded over owing to various causes.

Archaeology ranks as a science, but it has as yet neither the terminology nor the classification needed in sciences, nor the body of type specimens which are essential for scientific work. Botany, for instance, needed the labour of Linnaeus and the great herbaria of Kew and other centres before it could deal with Nature: Mineralogy needed the chemical order, and the mathematics and geometry of Haüy and his followers, beside the great type collections: Entomology has an immense range, and can only be advanced with the aid of great type collections for comparison: Chemistry was a tangle until the organised atomic system of Dalton. In other branches of science the need is similar, a rational and complete book classification and type collections; without these no science can exist.

In Archaeology there is as yet no generally accepted scheme for the scientific registration of the works of man. Many a student (if he publishes at all) gives drawings which have no common register with any other work. Publications are a chaos of repetitions, and hundreds of plates must be searched to find comparisons with fresh discoveries. Corpus lists have been organised and published for Egypt and for Palestine, but they are neglected by the compilers of confusion. Even in the most favoured lands and periods there is no table of all the types of pottery of the Greek or Roman civilisations. Not one of the many students of Classical Archaeology will spend a month at Pompeii and Naples, drawing the pottery of the best defined age. Yet till a system is laid down for the dated material—which is the A, B, C of Archaeology—there can be no science of the subject. It is like Botany before Linnaeus.

This condition is largely due to neglect of Science among the students, whose ideas are limited to Art and Language. It is rare to find an excavator who has the requisite competence to use mineralogy, chemistry, surveying, geology, drawing, and other essentials. We find books of research which ignore the commonest physics, and even arithmetic.

The necessary type collections are seldom formed; and, if formed, they have a bad chance of survival. The needful space has never been provided for all the types of products found in any country, although the modern freaks of fancy glass and porcelain find ready housing. This is like a Chemistry which only dealt with scents or colours; it would lead nowhere in understanding the general subject. Till we have the necessary collections for comparison, especially of pottery, there cannot be a science of Archaeology. The possibility of great type series is bounded by the cost of sites and building. It is useless to expect the requisite gallery space in Central London; any collection within a couple of miles of Charing Cross is certain to be heavily curtailed and restricted to show specimens of merely general interest. Though for small objects, such as insects, type collections are possible in London, for bulky objects it is essential to get room enough by going elsewhere.

We may now turn to consider the relations of the excavator with the national museums involved. The ideal conditions for both parties were reached

most nearly by Maspero in Egypt. Though an amiable despot, he had a sense of the ultimate interests both of archaeology and of the Cairo Museum, which led him to keep up a frank and open fellowship with the excavator. The extent of the concession was anything up to a whole province, so long as no other concession was encroached upon, and in that region the excavator was largely trusted to act as the agent of the Museum interests, examining any likely clues, and choosing his work according to the prospects. This resembles the method recently outlined by Comte du Mesnil du Buisson in his handbook on excavating.

In general, the division of the results was fair; perhaps one year Maspero needed more than half, but that was offset by leaving the larger part to the excavator in other years. When the requirements of the Museum were exceptionally large, the law provided for taking the whole of the results of excavation on paying the cost of the season's work. This led to part payment when more than half was wanted. True, it was "Heads I win, tails you lose," a fat season could be solely to the benefit of the Museum, and a lean season the loss of the excavator. Yet both parties had definite rights and obligations; but recently the tendency has been to rule that the national museums have all the rights, and the excavators all the obligations.

The belief in the possibility of prohibiting the export of antiquities which has recently manifested itself is fallacious. If an object be worth a few pounds it does not pay to smuggle. If it be worth thousands, no laws will prevent its being smuggled out to a good market. A Greek vase can leave Athens as a flower-pot, the finest statuary can leave Iraq and be bought in London or America, and large pictures can leave Italy in the roof of an omnibus. Hence restrictive laws only retain the second-rate; the first-rate is out of reach of the law. This state of things emphasises the need of liberal and frank co-operation between the national museum and the excavator in each country, so that the tie of honour is respected on both sides.

Officials seem to forget that a full excavation means £2,000 or more a year spent in the country. To replace the work and finds of eight or ten excavating parties driven away by vexatious conditions—as in Iraq—would entail a charge of some £40,000 on their government's budget. Moreover, to oppress and harass the excavator destroys his zeal for work, if he *does* come to the country.

The larger part of the present difficulties in various countries is due to a narrow spirit of nationalism. Too often political influences press on an able curator, so that he dare not let go the objects which are not actually wanted in the interest of his museum; he fears to be accused of favouritism if anything good is released to the excavator, even when it duplicates what is already in hand. Where possibly the curator might lack the knowledge or experience to judge at sight, the fear of letting something of value escape would tend to cause an absurd stringency in the division of finds.

Needless trouble has recently arisen from the great amount of paper work demanded by the various authorities concerned. The purely mechanical listing of finds has various ill effects: it confuses the scientific registration by plan, position and level; it obscures the meaning of things; it uses up the time and attention of the excavator, which should be given to preparing a record for publication, and it often becomes an excuse for publishing nothing. A useful rule would be that no division of objects be made until the proof sheets of the plates are produced with every type object figured. Thus the published account would be ready a few months after the excavation, and it should supersede the preparation of long catalogues of duplicate objects.

The excavator should always have publication in view, and as soon as any object is found he should think how it can best be illustrated and recorded. Lists which have to be rearranged for book form imply wasted time. In some cases one meets with long verbal descriptions, which are useless if a figure and reference are supplied. Greenwell's *British Barrows* is a painful example, needing to be translated into plans by the reader before it can be understood.

It is generally recognised that it is the excavator's duty to preserve and record everything that is found. Woe to him if some common pottery is not duly registered! Yet, strange to say, every Government—outside England—entirely neglects to secure the most attractive objects—the gold work. Gold demoralises both the diggers who find it and the curators who select their museums' share of the finds. It cannot be expected that a digger will hand over for nothing the most valuable things which his pick discloses. To pay the metal value of gold and silver objects is the only way to ensure getting them. But the scientific excavator who thus makes sure will find that after paying for the work and also for the treasure, no allowance even for the metal is made when the things are taken by the government. This is simply because the legalised excavator is in the clutches of the Department of Antiquities; if any other man makes an accidental discovery he is promised the full market value, because no other terms will secure the find. It is only the scientific excavator who can be plundered safely. No wonder that the goose is killed that lays the golden eggs. An excavator is driven to the point that he cannot afford to find gold. How then does Archaeology fare? No gold is reported from some of the richest places. It is lost owing to the cupidity of the authorities, while gold is found every year in excavations where it is paid for.

In Rome, the Palatine excavations were inspected by officials who were awkwardly surprised when a great hoard of gold coins went direct to the dealers, and a large profit above mere gold value was lost to the government. At Ravenna, dock-workers found a body in gold armour, buried near the empty tomb of Theodoric; only one fragment was secured for the Museum. In England gold almost always went astray, or to the melting pot, till at last the energy of Sir George Hill impressed on the Treasury that force was useless, and now every finder can get fair value from the British Museum.

The encouragement produced by giving rewards for all that is found is a necessary part of efficient excavation. It quickens wits and sharpens eyes. At the Richborough excavations few coins were preserved until they were paid for, and then dozens came in. No one has a moral right to open up sites without securing all that is found. It is alleged in excuse that the finds will be contaminated by a mixture of things from outside, but only an incompetent excavator would be thus deceived. Such rewards seldom cost more than 5 per cent. of the total charges (apart from gold), and the method pays the excavator four times over: by securing honesty, stimulating discovery, by the care of fragments, and by the inducement to a better class of diggers attracted by great chances. Rewards must be paid immediately, for delay spoils the effect. No force, no overseers, are wanted; a friendly co-operation with interests in common, backed by instant dismissal for any deceit or ill conduct, is the road to success. Train your archaeologist in all that he ought to know, enlighten officialdom and nationalist rulers, and there would be a fair chance of learning the history of man in the past.

FLINDERS PETRIE.



## SYRO-CAPPADOCIAN STAMP SEALS IN THE MUSEUM OF THE ACADEMY OF SCIENCE, LENINGRAD.

RECENT archaeological research has proved the wide spread of both cylinder seals and stamp seals in Elam, Mesopotamia, Cappadocia, and Syria. The variety of shapes among the stamp seals was very large, particularly in Cappadocia and Syria. Though the classification of types has been established by Hogarth,<sup>1</sup> Contenau,<sup>2</sup> and Delaporte,<sup>3</sup> a certain number of new types have been found, and I propose to illustrate these by examples in the Museum of Palaeography at the Academy of Science, Leningrad. I have to thank the Director of that museum, N. P. Likhatcheff, for his permission to publish these seals, the designs and inscriptions on which I photographed from their impressions on white modelling wax.

Though they were all acquired by purchase and their actual provenance is in every case unknown, these seals can be assigned to certain regions and periods by comparison with seals found *in situ* by Chantre,<sup>4</sup> Woolley, and others.

*Pl. I, figs. 1a, 1b.* Black steatite; carefully made but much worn; quadrilateral base  $24 \times 20$  mm., height 9.5 mm.; concave sides, boss on back transversely pierced by hole 3 mm. in diameter. On the flat base, the lion-headed eagle, Imgig, clutches with its talons the hindquarters of two horned quadrupeds with long tails (bulls?). Two smaller birds are seen above the wings of the eagle.

This seal is undoubtedly Cappadocian (cf. Hogarth, *Hittite Seals, with Particular Reference to the Ashmolean Collection, Oxford*, 1920, p. 20, fig. 16; p. 21, fig. 17, A, B, E; pp. 99-100), for its shape is alien to Mesopotamia; but the design on it is early Mesopotamian (c. 3500-3000 B.C.).<sup>5 6</sup>

*Pl. I, figs. 2a, 2b.* Light brown limestone; much worn; quadrilateral base  $19 \times 17$  mm., height 16 mm.; round-topped, flat-sided boss transversely pierced by hole 2 mm. in diameter; linear incision along three edges of base. On the flat base, an apparently bearded god, with horned tiara and wearing the *kaunakes* and a shawl passed over the right shoulder, is seated on a stool; a long tress of hair with curling end falls down his back. Before the god, a scorpion, a star, and various indistinct marks fill the field.

This seal also is Cappadocian in shape (cf. Hogarth, *op. cit.*, p. 20, fig. 15B; p. 32, figs. 122, 127; p. 30; p. 100). The ritualistic scene is, however, characteristic of Sumerian and Akkadian cylinder seals<sup>7 8</sup> of the third millenium B.C., save for the absence of worshippers. In Mesopotamia this composition was based on social conditions, and in Cappadocia also it may have corresponded with a similar social differentiation; Nos. 1, 2 and 3 were probably cut for the use of princes, state functionaries, priests or other representatives of the dominating class in the primitive state of that time.

*Pl. I, figs. 3a, 3b.* Yellowish-white limestone; much worn; truncated pyramid, with quadrilateral base  $15 \times 14$  mm., height 9 mm.; horizontally pierced near top by hole 2 mm. in diameter. On the base is a scorpion, with drill marks (?) on the tail.



1 a.



1 b.



2 a.



2 b.



3 a.



3 b.



4 a.



4 b.



5 c.



5 a.



5 e.



5 d.



5 b.



5 g.



6 a.



6 b.



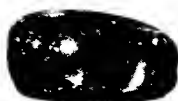
6 c.



6 d.



6 e.



7 a.



7 b.



8 a.



8 b.



9a



9b



10a



10b



11a



11b



12a



12b



13a



13b



14a



15b



15c



14b



14c



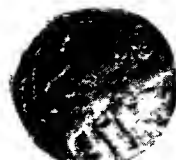
15a



16a



17b



17c



16b



16c



17a

This is an essentially Cappadocian shape (cf. Hogarth, *op. cit.*, p. 18). The scorpion was a religious symbol in Mesopotamia where it often occurs on archaic cylinder seals, both alone and in stylized beast-groups.<sup>9 10</sup> But it is also quite frequent on early Syro-Cappadocian cylinder and stamp seals (cf. Hogarth, *op. cit.*, No. 30 (cylinder); No. 56 (hemispheroid), both of steatite).

Nos. 1, 2 and 3 were engraved with three tools, the point, the chisel and the bow-drill. The material was in each case a soft stone. There is no doubt that they were local productions of Cappadocia, or, perhaps, neighbouring regions to east and south. Nos. 1 and 2 show considerable skill in stone-cutting. The primitive engravings, on the contrary, are characteristic of local craftsmanship only in their style, their subjects being obviously borrowed by local artists from Mesopotamian cylinder seals. Although later than the originals, these scenes belong to the third millenium B.C., a period when cylinder seals were not usual in Cappadocia, and they show once more the mixed character of the Cappadocian culture. Indeed, Mesopotamian colonies are known to have existed in Cappadocia in that millenium, though it is unnecessary to agree with Hogarth that "any culture which Cappadocia possessed before 1500 B.C. was Mesopotamian." On the other hand, the local glyptic production was not yet properly Hittite at that time; further excavation is needed to throw light on this subject.

It seems possible now to refute Hogarth's assumption that the origin of the Cappadocian stamp seals was comparatively late (c. 1400 B.C.): he "excluded from consideration Cappadocian sealings, possibly of the Ur period" (*i.e.*, c.2420-2300 B.C.) "as not proving local production—the imprints may have been made with Mesopotamian seals." On the supposition that the stamp seal was invented only "in the early days of the Hattic power," Hogarth completely omitted the earliest stamp seals from his classification; there the archaic glyptic is represented solely by cylinder seals as Class IA, whereas each of the following Classes II, III, and IV contains cylinder seals (A) and stamp seals (B). In my opinion our Nos. 1, 2 and 3 carry back the invention of stamp seals in Cappadocia probably to the third millenium B.C., if not earlier. And I venture to make a Class IB to include Nos. 1, 2 and 3, and certain stamp seals of the Ashmolean collection, *e.g.*, the steatite "loop" No. 263 (Hogarth, *op. cit.*, pl. IX, pp. 43, 84), on which a worshipper stands before a seated deity, with a crescent moon between them. This seal Hogarth assigns to his Class IVB. Its shape and its subject, borrowed from the Mesopotamian repertory but engraved in the crude Cappadocian manner, are clearly characteristic of early Cappadocian stamp seals, though it seems to be rather later in style than No. 2.

When the stamp seals now placed in Class IB are sufficiently numerous, further differentiation into sub-classes will be necessary, for Hogarth's Class I comprises too long a period—from the earliest times until c. 1600 B.C.

*Pl. I, figs. 4a, 4b.* Black steatite with grayish patches; triangular base, 21 x 18 mm., with rounded angles, height 12 mm.; the nearly hemispherical boss horizontally pierced by hole 4 mm. in diameter. On the flat base a quadruped is rudely engraved—apparently with the point only—and on it another is springing with open jaws. This is perhaps a conventional, geometrically schematised representation of a lion attacking a running horse. Similar rudely incised animals are seen on a seal from the region of Smyrna, now in the Louvre.<sup>11</sup> Both the conventionalised design and the unnatural attitude of the animal filling the upper part of the field show No. 4 to be very primitive.

I consider that both the shapes and the style of engraving of early seals of this type represent the local craftsmanship of Cappadocia. Towards the end of the third millenium B.C. a new period of Cappadocian history opened with the collapse of the Mesopotamian influence. A marked decline in artistic skill set in, and the seals that were produced evidently belong to an undeveloped society and reveal purely local characteristics. These seals bear no decisively Hittite elements as do the Hittite cylinder seals of the next period: they probably were made by a people which preceded the Hittites in those regions.

The following two seals differ very much from those already described.

*Pl. I, figs. 5a, 5b, 5c, 5d, 5e, 5f.* Black steatite; much worn; massive quadrilateral prismatic body,  $25 \times 22$  mm. at base,  $23 \times 21$  mm. at shoulder, total height 48 mm.; bead-like handle pierced horizontally by hole 2 mm. in diameter. On the base *5b*, a winged lion-gryphon (?) is seated with tail erect and various indistinct marks occupy the field before him: on the side *5c*, a similar animal faces left, its head with open beak worn and indistinct: side *5d* shows a lion with open jaws but no wings: side *5e*, a bull with the ground line indicated at a level above his hoofs: and side *5f*, a man with a cap (?) and apparently a short garment, his hand raised and presenting the open palm to an altar of incense (?)<sup>12</sup> from which a flame seems to be rising.

A somewhat similar seal in the Louvre (Gaudin Collection), acquired in Western Asia Minor, has similar scenes engraved on the four sides and the base,<sup>13</sup> and though in Hogarth's classification there is nothing precisely analogous in shape, such scenes occur on acknowledged Hittite stamp seals. There is then sufficient evidence to regard No. 5 as a Syro-Cappadocian or North Syrian seal. The monotony of the attitude and size of the animals walking as in file suggests that the *motif* was derived from the decorative borders on pottery and also on archaic cylinder-seals.<sup>14</sup>

The style of engraving differs from that on the earlier seals here described; it was done with a hollow chisel instead of the point, so that the animals appear more realistic and vigorous than on No. 4, for instance, where they are completely lifeless. Indeed, the animal figures on No. 5 might be regarded as predecessors of those seen in the developed Assyrian art of the IXth-VIIIth centuries B.C.

The seated lion-gryphon on the base of the seal differs from the usual Hittite representation in having the two wings displayed instead of their being represented in profile by one. I therefore assign No. 5 to the period of decline of the Hittite power and the cultural decay of those regions—probably to the end of the second millenium B.C., and perhaps even the beginning of the first.

*Pl. I, 6a, 6b, 6c, 6d, 6e.* Faience; much damaged by wear; quadrilateral prism, base and top  $12 \times 12$  mm., height 21 mm.; pierced lengthwise by hole 4 mm. in diameter. The hole is not quite in the middle, but nearer to one angle; it is probably the work of an unskilled craftsman. Only inside the hole is the faience white; on the outside, the seal appears to be gray glazed, but unequally, so that damage by fire is suggested, and hence the possibility that this seal was found in a cremation grave.

On each side, the representation of an animal is framed above and below by a ladder border: on side *6a*, a stag, with a fawn beneath it and bird above, faces a tree; on side *6c*, a lion has an arrow in its back; on side *6d*, a winged lion-gryphon (cf. *Pl. I, fig. 5b*) stands over a plant; and on side *6e*, a goat suckles her kid while an eagle is poised above. The engravings were apparently done with point and chisel.

Though there are no seals of this type in Hogarth's classification, one of similar style has been found in the Ališar mound in Anatolia<sup>15</sup> and dated to the first millenium B.C. This seal is engraved in the same style, with the self-same ladder border framing the scenes above and below (cf. also, Pl. II, figs. 11*b*, 13*b*, 15*b*). Another seal of identical shape, found in the necropolis at Minet el-Beida, Syria,<sup>16</sup> in 1931, and dated to the XIVth or XIIIth century B.C., has the same ladder border, not only above and below the scenes but dividing each side into two registers. Birds and beasts of similar style to those on No. 6 fill the sides of this seal.

The essential features of this type of seal are its size, the vertical hole, and the nearly continuous row of animals distributed round the four sides. It is possible that seals of this shape were an intermediate stage between cylinder seals and flat stamp seals<sup>17</sup> at the period when the former were going out of fashion and stamp seals coming more and more into vogue at the close of the second and beginning of the first millenium B.C. The rows of animals were apparently copied from the imprints of cylinder seals, in which images can be repeated *ad infinitum*: cf. the row of similar animals on a cylinder seal of black serpentine in the Pierpoint Library,<sup>18</sup> where the horns of the stag are represented in the same way as on No. 6*b*. Ward dates that seal at "perhaps 1000 B.C.," which seems to be approximately right. But I think he was wrong in regarding it as Babylonian; its style is Syro-Cappadocian. These rows of animals on the cylinder seals may have been derived in turn from similar rows on pottery, examples of which were found in Stratum IV (the epoch of the Hittite Empire) at Ališar.<sup>19</sup>

The spread eagle seen on No. 6 and also on the seal from Minet el-Beida is undoubtedly inherited from the Hittite glyptic art of the second millenium B.C.

As the engravings on No. 6 are also akin to engravings on cylinder seals from the cremation burials at Merj Khaimis, north of Carchemish (cf. Hogarth, *op. cit.*, p. 79, fig. 87), the burnt surface of No. 6 is significant. On the evidence available, I am inclined to date No. 6 to c. 1000-900 B.C., a date which accords with von der Osten's dating of his Stratum IV and seal at Ališar. Though this transitional period is still obscure, it may be useful to regard No. 6 as the nucleus of a new group to fill a gap in Hogarth's classification of so-called Syro-Cappadocian seals. Indeed, Nos. 5 and 6 with their local workmanship and primitive though vigorous designs may have belonged to vassal peoples in the Hittite empire.

The remaining stamp seals to be discussed are engraved with geometrical designs and script-characters.

Pl. I, 7*a*, 7*b*. Greenish schist; very roughly made and badly worn; bead-like, irregular oval base 22 × 18 mm., height 11 mm.; horizontally pierced between base and rounded top by a hole 4 mm. in diameter. The flat base bears a lattice design roughly incised with a point. Similar geometrical designs occur on a seal in the Louvre (Gaudin Collection),<sup>20</sup> and one from Tell Basher which Hogarth (*op. cit.*, pl. VII, no. 213, pp. 39, 77) assigns to his Class III B (1400-950 B.C.). No. 7 is then Syro-Cappadocian, though characteristic Hittite elements are wanting. Its rudimentary shape and the rough geometrical pattern inherited from the Neolithic decorative repertory through the Bronze Age lead me to assign it to the third (perhaps even to the fourth) millenium B.C.

Pl. I, 8*a*, 8*b*. Black serpentine (?); roughly made; irregular oval base 17 × 15 mm., height, including short handle slightly on one side of back, 11 mm.;

horizontally pierced by hole 3-4 mm. in diameter, also slightly to one side. On the flat base is what appears to be an inscription of seven characters, some doubt as to whose authenticity cannot be excluded. Similar characters are, however, to be seen on Syro-Cappadocian seals in the Ashmolean collection (Hogarth, *op. cit.*, pl. X, pp. 45-7).

Though no seals of exactly similar shape are known to me, it seems that its form was derived from Hogarth's "loop" (*op. cit.*, pp. 20, 21, figs. 15-17), and the decadent character of the script also attests a late date.<sup>21</sup>

The two following seals belong to the group which Hogarth (*op. cit.*, pp. 21-2, fig. 20) has well named "hammers," from the shape of the handles.

*Pl. II, 9a, 9b.* Black steatite; nearly cylindrical base, 12.5 × 11.5 mm. by 6 mm. high; height, including hammer-shaped handle, 20 mm.; bar of handle transversely pierced by hole 3 mm. in diameter. An incised line along the top of the handle is partly worn away. On the flat base a border of continuous spirals between circles frames an inscription. Such a frame is familiar on Syro-Cappadocian, and especially on true Hittite seals (Hogarth, *op. cit.*, pl. VII, pp. 38, 75), concerning which Hogarth remarks that these spirals are indistinguishable from the finest Late Aegean spirals, *e.g.*, those of Cyprus. The bases of these "hammer" seals vary considerably, being cylindrical, cubical, octohedral, faceted, discoid; they are often engraved on the sides as well as underneath, as on one in the British Museum (Hogarth, *op. cit.*, p. 74, fig. 77*b, d*), where the border of spirals is doubled. There are also interesting specimens at Berlin.<sup>22</sup>

*Pl. II, figs. 10a, 10b.* Bronze; cylindrical base, with markedly concave side, 23 mm. in diameter by 10 mm. high; height, including long-necked "hammer" handle, 31 mm.; bar of handle, tapered towards either end, transversely pierced by hole 3 mm. in diameter. On the flat base, four continuous spirals not symmetrically placed are framed by a circular ladder border. A silver seal of identical shape in the Louvre<sup>23</sup> bears the same design, which is also engraved on a very peculiar steatite seal, No. 418, in the Hermitage Museum.

According to Contenau,<sup>24</sup> "hammers" belong to the period 1550-1100 B.C., and he assigns those of copper and silver to the later half of the second millenium B.C. Hogarth (*op. cit.*, pp. 73, 101, 104) rightly regards "hammer" seals as a development from "stud" seals, and as invented in Cappadocia—not a single specimen has been found in Syria. Of them he says that they "were used doubtless for the signets of kings and princes towards the end of the great period of Hattic power, the late fourteenth and the thirteenth centuries" before our era.

*Pl. II, figs. 11a, 11b.* Copper, with the surface darkly patinated; conical base 14 × 13 mm., height, including bead-shaped swelling at top of base and flattened handle, 25 mm.; handle pierced by hole 2 mm. in diameter. On the flat base, an inscription in seven characters is framed by a ladder border (cf. No. 13*b*, and also the design on certain Syro-Cappadocian seals in the Louvre).<sup>25</sup>

Though the shape of this seal is perhaps unique, it is obviously related to the handled Cappadocian seals that Hogarth has named "stalks" (*op. cit.*, p. 20, figs. C, E), and to a copper seal in the Louvre.<sup>26</sup> This elaborate seal evidently belongs to the same region and epoch as the "hammer" seals.

*Pl. II, figs. 12a, 12b.* Black steatite; fragmentary and much worn; flattened conical base 21 × 20 mm., present height, including shelf-like expansion at top of base and part of the neck, 14 mm. On the flat base, a roughly incised inscription is framed by a circular border.

This seal obviously belongs to the same Cappadocian family as No. 11. Its characters recall those on Hissarlik whorls and Enkomi balls, *i.e.*, from Asia Minor and Crete, which Hogarth (*op. cit.*, p. 89, fig. 112) regarded as cognate with certain Hittite characters.

*Pl. II, figs. 13a, 13b.* Black steatite; much damaged; thick circular base 24×23 mm., height, including thick, vertically grooved neck and the nearly hemispherical head, 28 mm.; horizontally pierced through the head by a hole 4 mm. in diameter. An incised line runs round the base, beneath which an inscription is framed in a circular ladder border, as on No. 11b.

This extraordinary seal obviously belongs to the Cappadocian family: in shape it appears to be a peculiar combination of Hogarth's "knob," his massive "stud," and the "stalk" (*op. cit.*, pp. 20-21, figs. 18, 17, 15). A black steatite seal of somewhat similar shape but smaller is seen in the Louvre.<sup>27</sup> The clumsiness of No. 13 compared with Nos. 9 and 10, which belong to the best period of the Hittite culture, is reminiscent of No. 5 and indicates a certain decay in the glyptic art. It is probably to be assigned to the period of decline of the Hittite Empire, and the style of the inscription supports this dating.

The four button-shaped "seals," Nos. 14-17, are typically Hittite. Seals of this type were always cut in soft stones, chiefly steatite, with both upper and under sides convex and engraved—the shape an inconvenient one for a seal, the engraving of both sides unnecessary, as one side alone would have served the purpose. Garstang<sup>28</sup> and Hogarth (*op. cit.*, pp. 22, 87) regard them rather as "amulet pendants"—Hogarth named them "bullae," but I would prefer to designate them "button-pendants."

*Pl. II, figs. 14a, 14b, 14c.* Black steatite with yellowish veining; 22 mm. in diameter, height 15 mm.; diameter of hole 3 mm. A Hittite inscription within a linear border on each face.

This button-pendant is said to have been found at Tell el-Amarna.<sup>29</sup>

*Pl. II, figs. 15a, 15b, 15c.* Dark green steatite; 26×25 mm. in diameter, height 16 mm.; diameter of hole 5 mm.; two deeply cut parallel furrows round the middle. An inscription on each face: within a ladder border on one face, enclosed in a circle on the other. Cf. similar "seals" at the Louvre.<sup>30</sup>

*Pl. II, figs. 16a, 16b, 16c.* Dark red steatite; much damaged and worn; 25×24 mm. in diameter, height 13 mm.; diameter of hole 4 mm. On one face, script and two symmetrically disposed stars within a border; on the other face, deep linear incisions framed by a deeply cut border. Cf. Hogarth, *op. cit.*, pl. X, pp. 47, 48; p. 91, fig. 115, for similar button-pendants with decadent Hittite script.

*Pl. II, figs. 17a, 17b, 17c.* Yellowish-gray pottery;<sup>31</sup> damaged and much worn; 23 mm. in diameter, height 15 mm.; diameter of hole 3 mm.; three parallel lines incised round the broad middle. On the better preserved face, a symmetrically placed geometrical design is enclosed in a circular line; the other face has been partially destroyed.

According to Hogarth (*op. cit.*, p. 91), button-pendants ("bullae") of this type form 90 per cent. of the Hittite seals that bear inscriptions. There are good examples in the Louvre,<sup>32</sup> at Berlin,<sup>33</sup> and in the Hermitage Museum.<sup>34</sup> In the Ashmolean Collection, one from a house of sun-dried brick at Carchemish<sup>35</sup> is dated by Hogarth at probably the Xth century B.C.: others came from cremation graves at Deve Kuyuk and Tell Basher.

None of the button-pendants published here belong to the best period of



their production, *i.e.*, during the Hittite Empire in the second millenium B.C. At that period the workmanship and the script were much more careful; and, moreover, in the middle of the inscriptions there were often figures of fantastic animals, deities and kings.<sup>36</sup>

On No. 14 the characters seem to be true Hittite hieroglyphs, and this specimen is probably older than Nos. 15-17, whose inscriptions resemble those on a similar "Hittite seal" from tomb 523 at Mycenae, and now in the National Museum at Athens.<sup>37</sup> These latter seals obviously all belong to the period of the decline and fall of Hittite culture in the XIth to VIIth centuries B.C., coinciding with the cremation age. The large numbers and poor workmanship of these button-pendants suggest that they were used as amulets in all the various social strata, whereas the true stamp and cylinder seals, and also the earlier button-pendants, belonged to the privileged classes in the flourishing Hittite empire.

LENINGRAD.

A. PROCOPE-WALTER.

<sup>1</sup> Hogarth, *Hittite Seals, with Particular Reference to the Ashmolean Collection*, Oxford, 1920.

<sup>2</sup> Contenau, *La Glyptique syro-hittite*, Paris, 1922.

<sup>3</sup> Delaporte, *Catalogue des cylindres et cachets orientaux*, Musée du Louvre, Paris, 1920-3.

<sup>4</sup> Chantre, *Mission en Cappadoce*, Paris, 1898.

<sup>5</sup> Frankfort, *Iraq Excavations of the Oriental Institute*, 1932-3, Chicago, 1934, p. 49, fig. 29.

<sup>6</sup> Ward, *Seal Cylinders of Western Asia*, Washington, 1910, p. 32, no. 62a.

<sup>7</sup> Ward, *Cylinders and Other Oriental Seals in the Library of J. Pierpont Morgan*, New Haven, 1920, pl. II, figs. 11, 12, pp. 28 f.

<sup>8</sup> Delaporte, *Catalogue des cylindres de la Bibliothèque Nationale*, Paris, 1910, pl. VIII, p. 43 and Introd., p. xi.

<sup>9</sup> Delaporte, *Les cylindres-sceaux du Musée de Florence*, Aréthuse, 1927, pp. 56 s., pl. VII, no. 7.

<sup>10</sup> Hermitage Museum, no. 514 (probably of IVth millenium B.C.), on which similar drill marks are seen on the scorpion's tail.

<sup>11</sup> Delaporte, *Cat. Louvre*, pl. 60, fig. 6b, p. 96.

<sup>12</sup> Cf. the column-like offering-table on the Hittite ("syro-cappadocien") cylinder seal no. 451 of the Bibl. Nation.; Delaporte, *op. cit.*, pl. XXX, p. 253.

<sup>13</sup> Delaporte, *Cat. Louvre*, pl. 60, fig. 10a-f, p. 96.

<sup>14</sup> Cf. the files of animals on archaic cylinder seals of Elam and Mesopotamia; for example, in the Louvre, Delaporte, *Cat.*, pls. 25, 26, 27 (*Délégation en Perse*); pl. 63 (Sumer and Akkad, *Acquisitions*).

<sup>15</sup> von der Osten, *Discoveries in Anatolia*, Chicago, 1933, p. 33, fig. 31, no. C 2581.

<sup>16</sup> *Archiv für Orientforschung*, t. VII, 5/6, s. 294, "Ausgrabungen in Minet el-Beida"; cf. fig. 3.

<sup>17</sup> Cf., Procopé-Walter, "Ein Bindeglied zwischen Rollsiegel und Hemiovoid (Scarabäoid)," *Archiv für Orientforschung*, t. VI, 2/3, pp. 65-74.

<sup>18</sup> Ward, *op. cit.*, pl. XVIII, no. 130, p. 68.

<sup>19</sup> Erich Schmidt, *Anatolia through the Ages: Discoveries at the Alishar Mound*, 1927-9, Chicago, p. 115, fig. 158.

<sup>20</sup> Delaporte, *op. cit.*, pl. 60, figs. 1, 2, p. 96, seals roughly shaped like a duck's head and a horse's hoof.

<sup>21</sup> Cf. Contenau, *op. cit.*, pp. 170 ff., IIIrd period : XIth–VIth centuries B.C.

<sup>22</sup> Ed. Meyer, *Reich und Kultur der Chetiter*, Berlin, 1914, p. 46, fig. 37. This seal has Hittite hieroglyphs on the base ; for the shape, cf. an exquisite octohedral variation of the same type (but with the top broken off), *ibid.*, pl. IV, pp. 15 f., with Hittite characters framed by a typical guilloche on the base, but with gods and worshippers, manifesting Babylonian influence. Meyer and Prinz date this seal to the first half of the second millenium B.C.

<sup>23</sup> Delaporte, *op. cit.*, pl. 101, fig. 6a–b, p. 202.

<sup>24</sup> Contenau, *op. cit.*, pp. 121 ff., IIInd period ; cf. also p. 98, pls. X–XII.

<sup>25</sup> Delaporte, *op. cit.*, pl. 100, figs. 7b, 20b, pp. 200 f.

<sup>26</sup> *Ibid.*, pl. 98, fig. 12a, p. 198.

<sup>27</sup> *Ibid.*, pl. 99, fig. 5a, p. 199.

<sup>28</sup> Garstang, *The Land of the Hittites*, London, 1910, p. 160 ; *ibid.*, pl. XL, a button-pendant of ivory, from Denek-Madên.

<sup>29</sup> Hittite seals have been found in Egypt. A button-pendant in the Ashmolean Collection (No. 318 ; Hogarth, *op. cit.*, p. 47) was bought there.

<sup>30</sup> Delaporte, *op. cit.*, pl. 102, fig. 1a–b–c, p. 202 ; pl. 100, fig. 23a–b–c, p. 201, both of black steatite.

<sup>31</sup> Cf. a pottery Cappadocian handled seal : Chantre, *op. cit.*, pl. IV, fig. 15.

<sup>32</sup> Delaporte, *op. cit.*, pl. 100, fig. 23 ; pl. 101, figs. 2, 16, 17 ; pl. 102, figs. 1–7 ; for design, cf. Contenau, *op. cit.*, pl. XLIV, no. 333.

<sup>33</sup> Ed. Meyer, *op. cit.*, p. 47, fig. 38 : for shape, V.A. 3163, for design, V.A. 3162.

<sup>34</sup> Nos. 11361, 1288.

<sup>35</sup> Woolley, *Carchemish, II, The Town Defences*, London, 1921, p. 62, pl. 25, fig. b, 8 and 9.

<sup>36</sup> Cf. Hogarth, *op. cit.*, pl. X, nos. 313–8, pp. 46, 90.

<sup>37</sup> *Cambridge Ancient History*, Vol. I (plates), 1927, pp. 166–7, fig. h.

## NOTES ON A TEMPLE AT 'AIN AMUR IN THE LIBYAN DESERT.

'AIN AMUR, about 70 km. north-west of Kharga and the last waterhole on the northern route to Dakhla Oasis, was visited by the author in 1932. The accompanying photographs, and those few measurements and observations that it was possible to make without excavation of the buildings near the spring, are here published to place on record a site so remote as to be almost unknown. In recent years Mr. H. J. L. Beadnell alone has illustrated the ruins at 'Ain Amur by a general photograph.<sup>1</sup>

Earlier scientific visitors were Cailliaud, Drovetti and Edmonstone. Cailliaud, who translated Drovetti's account of "a Greco-Egyptian temple" at 'Ain Amur,<sup>2</sup> included a plan of it in his separate volume of plates,<sup>3</sup> and described the site in more detail.<sup>4</sup> According to Sir Archibald Edmonstone's account,<sup>5</sup> he found the temple in much the same condition as now.

Sir Gardner Wilkinson, who visited the site some years later, noted " . . . a small temple, and a well of water called Ain Amoor, surrounded by a large inclosure of crude brick, intended to protect the temple and to secure the spring. Kneph, Amunre and Maut are the principal deities; and though the name seems to be of a Cæsar, the temple has the appearance of greater antiquity than the generality of those in the oases."<sup>6</sup> In a later work he adds: "I could find no remains of a town, and it is possible that this temple was intended merely to add a sanctity to the site of the spring and to ensure its protection."<sup>7</sup>

Hoskins unfortunately did not visit 'Ain Amur, and merely quotes Cailliaud's observations.<sup>8</sup>

To the names of earlier explorers recorded at the entrance,

A. Edmonstone	..	..	..	..	..	Feb. 1819
J. I. Hyde	..	..	..	..	..	17 Dec. 1819
Drovetti Rocincana	..	..	..	..	..	1891
A. Barguss Desosten	..	..	..	..	..	1893
D. Morice	..	..	..	..	..	Dec. 1896,

the soldiers who occupied the oasis in the Senussi campaign during the Great War added their names.

The building as it now stands (frontispiece) is an oblong structure 16 by 8 m., the long axis north-west, south-east. Traces of walls at ground level are all that can be seen of the forecourt shown in Cailliaud's plan; this would have added nearly another 6 m. to the length of the building. In the centre of the south-eastern wall a narrow entrance leads through a massive portal, roofed with limestone slabs, 2.96 by 0.66 by 0.40 m., into which smaller stones of the succeeding course are slotted. At either end these have square holes in their upper surfaces, as seen in pl. III, A and B. Up to this level the doorway seems not to have been bonded to the adjacent walls; in the frontispiece the crack between them can be seen.

The interior is divided into two nearly equal parts by a wall 0.40 m. thick. Three metres north-west of this wall are traces of a second transverse partition, beyond which are three chambers, seen at a distance in the frontispiece, two of which are roofed by limestone slabs only slightly smaller than those over the entrance.

On the outside of the north-west wall are the carvings and inscriptions figured in pl. IV B, but so mutilated that insufficient remains to recapture the sense. The defacement appears to be of comparatively recent date. The facts that the roofs of the two chambers are at different levels and that their roofing



A

DOORWAY, PART OF N.E. WALL AND TRANSVERSE PARTITION.

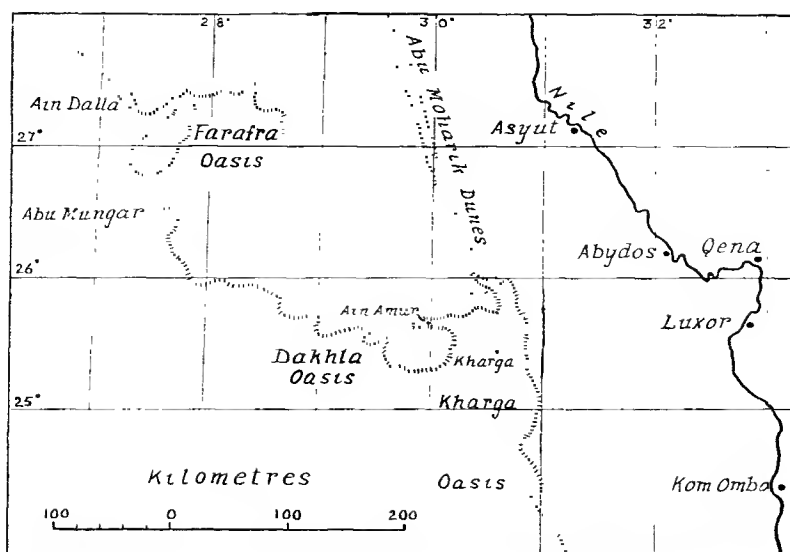


B.

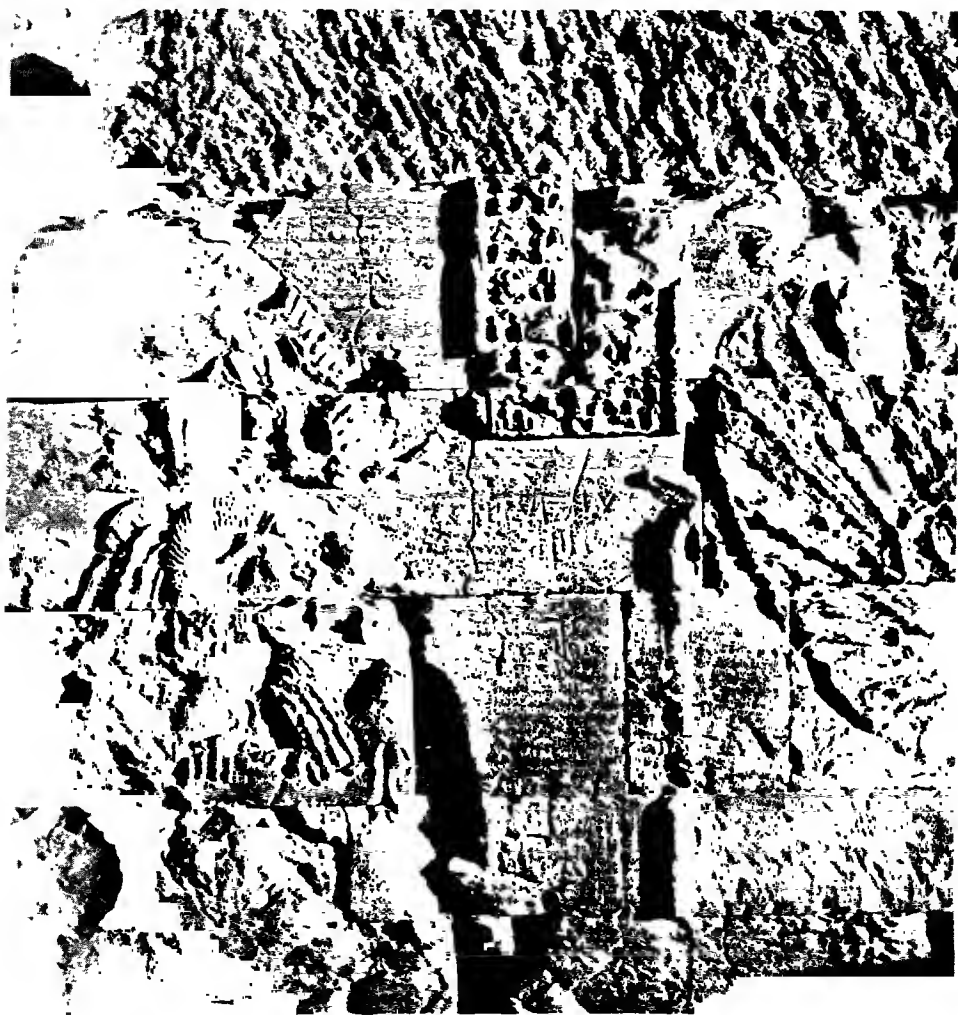
DOORWAY OF TEMPLE AND PART OF S.W. WALL.

PLATE III.





A.



B.

HIEROGLYPHS ON OUTSIDE OF N.W. WALL.  
PLATE IV.

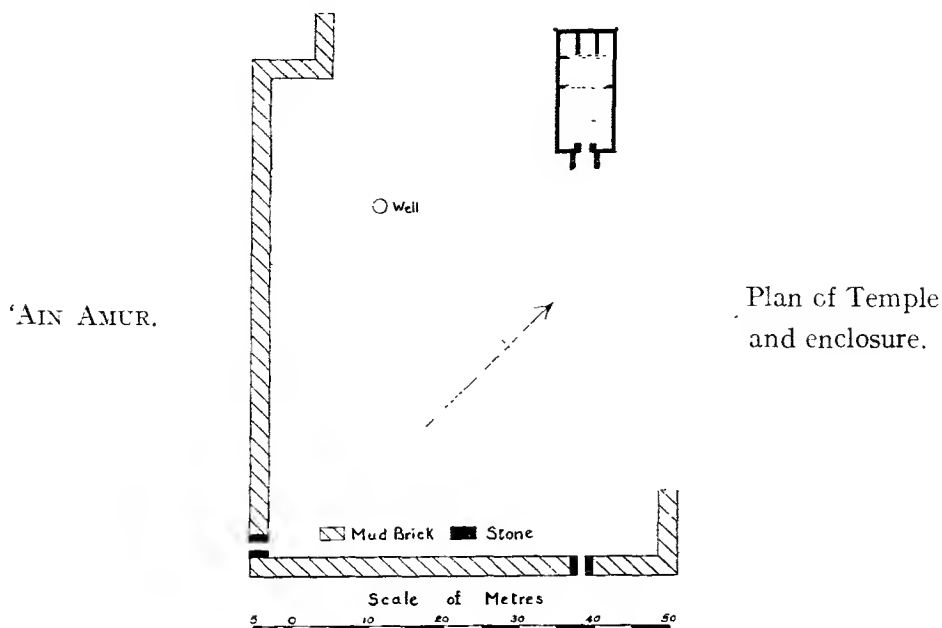




AIN AMUR.  
REED-FILLED WELL AND WESTERN ANGLE OF COURTYARD.  
PLATE V.







slabs truncate the inscription point to a certain amount of rebuilding at some unknown date.

Whereas the roofs are of limestone with coarse diagonal dressing, the walls are a fine-grained marl, in blocks which average 0.35 by 0.2 by 0.16 m. in size, though some are as large as 0.66 by 0.40 by 0.22 m. Some of these blocks show a fine diagonal dressing round the edges, with square pecked tool marks in the centre. No mortar was used.

To the south-west and south-east of the building are mud-brick walls, in places 5 m. high and 2.5 m. thick, which are apparently the remains of a courtyard, approximately 70 by 50 m. which enclosed the temple and well (see plan). A trace of a third wall is found in the eastern corner, but none on the north-west. One entrance of dressed stone lies 13 m. from the eastern corner, opposite the temple doorway and about 53 m. from it. A second, similar, entrance is in the southern corner at the end of the south-west wall. This wall after 63 m. turns at right angles (north-east) for 8 m., when there is another short stretch in the original direction. Pl. V shows this part of the enclosure with some remnants of mud brick buildings beyond the reed-filled well in the foreground. These walls were built in sections very inadequately bonded together, of bricks averaging 35 by 15 by 8 or 10 cm. in size. On the outside the courses are alternately of longs and shorts, on the inside all shorts. There are also traces of coarse plaster 2 cm. thick.

E. W. GARDNER.

<sup>1</sup> *An Egyptian Oasis*, 1909, p. 165 and plate opposite.

<sup>2</sup> *Travels in the Oasis of Thebes and in the Deserts situated East and West of the Thebaid in the Years 1815, 1816, 1817, 1818*, by F. Cailliaud, 1822.

<sup>3</sup> *Voyage à Meroë*, QIWE, pl. xlii, 1.

<sup>4</sup> *Ibid.*, 1826, vol. I, pp. 227-9.

<sup>5</sup> *A Journey to Two of the Oases of Upper Egypt*, 1822, pp. 60-1.

<sup>6</sup> *Topography of Thebes and General View of Egypt*, 1835.

<sup>7</sup> *Modern Egypt and Thebes*, 1843, vol. II, p. 366.

<sup>8</sup> *Visit to the Great Oasis of the Libyan Desert*, 1837, p. 250.

## REVIEWS

*Prehistoric Assyria (The Excavations at Tall Arpachiyah, 1933).* By M. E. L. MALLOWAN and J. CRUIKSHANK ROSE. Pp. xv, 178. Pls. XXII and Frontispiece, two coloured. 1935. (Oxford University Press.) 21/-

This bound volume is reprinted from "Iraq," vol. II, part I, and therefore does not possess an index, which considering its importance and the able way in which it is arranged and written is certainly a pity.

The site of Arpachiyah (Tepe Rashwa) lies less than four miles from the Tigris and the ancient city of Nineveh with which it was once connected, and though a small and low mound it has yielded an immense amount of most important material for the study of early man. The buildings found in it, all of extremely early date, were at first of *pisé* which later was partly supplanted by mud-brick. The early date of the site is evidenced by the four top levels containing remains of the Al 'Ubaid period, traces of which period were also found in a cemetery on the western side of the Tepe. No less than 50 graves were excavated. During the next period (3 m. below the surface) the houses were of better quality but built of *pisé*, and this period is referred to Tell Halaf times. That there was no overlap is indicated by the fact that the Al 'Ubaid grave-diggers destroyed Tell Halaf remains. In the upper two metres of the mound a few roughly shaped plano-convex bricks were found, which shows that this type of brick (peculiar to Mesopotamia) is earlier than has been supposed. In southern Mesopotamia it is thought not to extend further back than the beginning of the Early Dynastic Period (3,100-2,500 B.C.).

In the earliest levels of the mound a style of building was found that is new to Mesopotamia. These buildings, of which ten were excavated, had a circular ground plan, and stone foundations with a superstructure of *pisé*, and they lay at four distinct levels. The earliest of these *tholoi* were simple in structure, but as time went on they increased in dimensions and a rectangular room was added to the circular chamber. It would seem that these *tholoi* were domed, but how could not be ascertained as they were not in a good state of preservation; in only one building did part of the spring of the dome remain. Mr. Mallowan compares these *tholoi* with the modern bee-hive houses around Aleppo which are undoubtedly descended from them, and with the ancient bee-hive tombs of Mycenae. The latter, however, were underground, whereas the *tholoi* at Arpachiyah with one exception stood above ground. With some reason the excavator also suggests that the *tholoi* in the Mediterranean area may have been derived from early Mesopotamian examples. The thick walls of the latter and the fact that important burials of the Tell Halaf period lay in their close vicinity show them to have been important buildings, and it is thought that they were connected with a cult of the Mother goddess as a large number of figurines of this deity were associated with them.

A full description is given of the Al 'Ubaid ware, which was all of one generation as no grave overlapped another. The burials were in general oriented E. to W., and beads and stone celts were found with the bodies as well as much pottery, both painted and unpainted. Fractional burials formed about one-third of the whole.

The Tell Halaf wares found in the lower levels are of the utmost interest.

In two rooms especially of a single house in the sixth settlement, a quantity of polychrome pottery was found sumptuously painted in three colours, red, black, and white, on a pink-coloured clay or in lustrous red and black on a burnished orange-red slip. The illustrations, good as they are, do not do justice to this brilliant ware which was mostly simple platters, bowls and saucers, many of which were apparently derived from metal forms. A favourite design was a rosette in the centre, surrounded by narrow circular borders composed of one or several *motifs*. Another central device was a Maltese cross or square, and examples of the quartered circle with a four-petalled rosette inside are not unlike a device that was commonly used in the Indus Valley cities. The *motif* of intersecting circles that occurs on some of this Tell Halaf pottery is the device most commonly seen at Mohenjo-daro and Harappa. A characteristic feature of these very early wares from Arpachiyah is the circular spots surrounded by stippling which have strong affinities with the solar markings on much of the Mohenjo-daro pottery. Of especial interest is the *bukranium* design which Mr. Mallowan has traced from its early natural form to a developed type in which it is linked up to form a continuous pattern. Animal and plant designs were, however, comparatively rare; they were found only in the early period, chiefly on sherds of imported Samarra ware, of which only one whole jar was found.

Numerous pottery female figurines, some with hands touching the breasts, are undoubtedly figures of a "Mother goddess." Pottery figures of doves, a bird associated with this goddess in many other ancient civilisations including India, are of exceptional interest. The amulets are especially distinctive; the double-axe forms of the Tell Halaf period were, of course, a motive well known in Crete, where both the dove and the double-axe occur in the cult of the Mother-goddess. There seems, indeed, to have been some religious contact between early Crete and Western Asia, as Sir Arthur Evans has suggested. That many of the amulets found were used as seals is proved by numerous specimens of clay sealings that were used as dockets for store jars. The designs on these amulets are in the main of the simplest description, lattice patterns being the most common; though primitive in design they would be most difficult to forge. Not a single example of writing was found and no cylinder-seals occurred. Metal was very rare and one cast copper celt was found in the upper strata.

With regard to the dating the mound, Mr. Mallowan considers the first four levels as earlier than or just overlapping the Uruk period of Southern Mesopotamia, and he would correlate them with the Al 'Ubaid 3 of Woolley's work. The sixth level which marked the climax of the Tell Halaf ware he would provisionally assign to the Susa I period, leaving four or more levels from Pre-Susa I to Neolithic Iran.

There is little fault to find with this admirable report. Mr. Mallowan has made the utmost use of his material, and he is to be congratulated on a piece of work that has been very well done. I do not see, however, why he should use the word "terra-cotta" in place of "pottery," nor what is wrong with "faience" in place of "frit." To most archaeologists, "frit" is used for glazing; and it should not be used of articles of which it only forms a part.

E. MACKAY.

*Palestine and Israel.* By FLINDERS PETRIE. Pp. 99, pls. 16, 2 maps. 1935. (Society for Promoting Christian Knowledge.) 3s. 6d.

Sir Flinders Petrie has produced a book of less than a hundred pages giving clearly and explicitly the history of Palestine and Israel from the archaeological

evidence which has recently—and largely by his own exertions—been brought to light. He compares the archaeological evidence with the documentary records, so familiar to us in the Bible, and shows how one supplements the other. He is a past master in the art of giving the largest amount of information in the fewest possible words, yet with extraordinary facility of expression.

M. A. MURRAY.

*Das ägyptische Märchen (the Egyptian Tale).* By MAX PIEPER. Pp. 89. 1935. (Morgenland, vol. XXVII, J. C. Hinrichs.)

Terminological zeal is of no avail with Egyptian tales, for the attempt at exact definition of the "Märchen" breaks down in the case of ancient Egypt, and the term has to be used for all kinds of stories. However, the English word "tale" is good enough, and this study is entertaining and interesting: entertaining because the tales are well told under the sections (1) Old period, (2) New Kingdom, (3) Herodotus, and Demotic tales; and interesting because of the writer's critical equipment and wide survey. Tales of purely historical character, such as that of Sa-nehah and real myths (tales in which natural phenomena are personified) are omitted. In his review of the first section the author emphasises the point that these stories must have been worked up from pre-existing folk-tales, though none have been preserved. Another interesting point is that they should become literature so early. In the fourth and last section, entitled "Survival of the Egyptian tale in literature", the origin of the Faust legend is traced to Egypt. It seems likely that the story in the Westcar papyrus of the origin of the Vth dynasty influenced the Greek legend of the birth and destiny of Cypselus; the marriage of Peleus and Thetis seems to show the influence of the marriage of Bata told in the Orbiney papyrus, whilst the tale of the Blinding of Truth makes its first appearance in Egypt. Variants of the tale of the Treasury of Rhampsinit, told by Herodotus, are quoted from countries as far apart as Russia and Ireland. Egyptian motives are also to be found in India, which has long been regarded as the home of story, but it is not possible to prove that these were derived from Egypt.

L. B. E.

*Herkunft, Entstehung und antike Umwelt des hebräischen Volkes.* (The Rise, Origin, and Ancient Neighbours of the Hebrews.) By S. SPINNER. Pp. viii+539. 1933. (Vernay, Vienna.)

The composition of this book is peculiar: its 539 pages are divided into 214 pages of "Contents" and 325 of "Notes", with much repetition; there are two pages of printer's errors, and should be more, to mention only the varied spelling of names and many incorrect Bible references; and there is no index. On pp. 84-5, the chief god of Western Akkad (Hamath) is given, from 2 Kings xvii, 30, as Ashima; and the author identifies him with Baal-peor (Num. xxv, 3), the god of the Moabites and Edomites, and with the god called in Egypt by the "Aramaic" name of Set. On p. 188, 2 Sam. i, 18, is rendered as "he bade them teach the children of Judah cuneiform: behold it is written in the book of Jasher", though for "cuneiform" we read "use of the bow" in the Authorised Version and "song of the bow" in the Revised.

The main theme of the book is a fervent vindication of the historical truth of the Bible and an attack on modern Bible criticism, which has relegated the Mosaic books to a later date. From the 12th chapter of Genesis onwards the

Pentateuch is to be regarded as in the main historical and Moses is to be considered an historical person.

It is impossible to compress the author's equations into a small space, and an extract from Chapter 2 will illustrate his method and the ground he covers. In discussing the peoples called Subari in the cuneiform texts he states that they included many races of varied origin; that their country was Subartu, and that they were the Cush (Ethiopians) whose country is defined in Gen. ii, 13; that their name means burnt, *i.e.*, sunburnt; and that the wanderings of this Aramaic race may be traced by its gods, weights and measures from north to south via Syria to Egypt, and from east to west, to Greece and Italy. The author's argument, in short, is that the ancient names of countries, places, peoples and gods are derived from the Subari, and that as the Subari came from the Taurus region it is to Asia Minor we must look for the origin of "the system of weights and measures, of coinage, of alphabetic writing, and of the oldest codification of laws".

L. B. E.

*Exploration in Sind.* By N. G. MAJUMDAR. Pp. iii, 172, pls. 46, and map of Sind. Memoir 48 of the Archaeological Survey of India. 1934.

The survey of the deserted mounds of Sind made by Mr. Majumdar in three campaigns between 1927 and 1931 will prove of more and more importance as the problems which he has opened up are tackled by systematic excavation. This survey covered the greater part of the Indus Delta country and of the western bank and a portion of the eastern bank of the Indus in Lower Sind.

The outstanding result was the discovery at Amri and other sites of a culture that lies beneath and clearly antedates that of Harappā and Mohenjo-daro. The pottery of this earlier civilisation is identical with certain wares found by Sir Aurel Stein in S. Balūchistān and suggests western affinities.

Mr. Majumdar classifies the various kinds of pottery he found at the sites he visited in four groups :—

(A) Amri ware : thin, with geometric patterns painted in two colours on unpolished pinkish clay; in shape not unlike the ware found at Nal in Balūchistān.

(B) Indus Valley ware : thick, well baked, with designs that include plants and animals painted in black on a well-polished red slip. The examples found by Mr. Majumdar at Chanhū-daro (now being excavated by the Boston Museum of Fine Arts Expedition) are finer than those from Mohenjo-daro, where unpainted wares came to predominate.

(C) Thin ware, with designs including stylized plants and flowers painted in black or chocolate on a light red or buff slip, as at Jhukar. This ware, the author suggests, may be later in date than the Indus culture as known at Mohenjo-daro and Harappā.

(D) Black ware with incised geometric ornament, comparable with certain Early Iron age ware of the Madras Presidency.

An interesting point recorded in this survey is the existence of a flint-knapping station at Tharro below Tatta, which shows this region of Lower Sind to have been dry land in prehistoric times.

The tentative conclusions based by the writer on what he saw suggest the great importance of a thorough exploration of the mounds of Sind by well equipped expeditions. Only one corner of the curtain that veils the India of the third and fourth millennia B.C. and the pre-Aryan sources of its complex civilisation has been lifted: the glimpse afforded might well arouse a larger curiosity and lead to adequate inquiry and investigation.

D. M.

## JOURNALS

ANNALS OF ARCHAEOLOGY AND ANTHROPOLOGY—UNIVERSITY OF LIVERPOOL.  
Vol. XXII, Nos. 1, 2. 1935.

GURNEY, O. R.—*Babylonian Prophylactic Figures and their Rituals*.—Of a wide variety of types, these figures are well known from the texts; and made of clay they have been found at Ur and Sippar. Two important texts are here discussed: Text I, a ritual for the protection and purification of a house; Text II, a bilingual composition concerned with the healing of the sick. D. M.

ARCHIV FÜR ORIENTFORSCHUNG, IX, 1-2. 1934.

CHRISTIAN, V.—*Untersuchungen zur nordsyrisch-“hettitischen” Kunst*.—The writer's conclusions are as follows:—A geometric style, born of the Aegean migration of about 1200 B.C., appeared in Asia Minor, Northern Syria, and Mesopotamia, as in Greece, in place of the naturalism which had prevailed hitherto. It was carried presumably by the Phrygians and related peoples. In sculpture in the round this style maintained as far as was possible the cylindrical or cubist form dictated by the material, and in relief kept largely to the surface. From the previous period was, apparently, derived the principle of building with orthostats and of using reliefs for their ornamentation; numerous decorative motives, including animals, were, presumably, also derived from this source. The tendency to naturalism, which appeared at first gradually in Northern Syria and Mesopotamia, and more strongly from the outset in Asia Minor, must be considered as a return to the spirit of the art which had been ousted. This North Syrian “Hittite” art (the name is kept for the sake of convenience) vanished with the Assyrian conquest, but it certainly influenced Assyria, and presumably Persia of the Achaemenian period, via Armenia and Media.

BISSING, FREIHERR W. VON.—*Saitische Kopien nach Reliefs des Alten Reichs*.—A tablet which was dated by Borchardt to the IIIrd dynasty in *Ann. du Serv.*, XXVIII, pp. 43 ff., is considered here to be a Saïte copy of Old Kingdom reliefs.

SCHWENZER, W.—*Das Nationalheiligtum des assyrischen Reiches. Die Baugeschichte des Aššur-Tempels Ehursagkurkurra. IV. Die Inschriften Salman-assars I. vom Aššur-Tempel*.—This article is a sequel to articles which appeared in vols. VII and VIII of this journal.

SPEISER, E. A.—*The Continuance of Painted Pottery in Northern Mesopotamia*.—In Northern Mesopotamia there was no break in the occurrence of painted pottery down to Persian times.

BARTSCH, G.—*Eine neue chetitische Skulptur in Mittel-Anatolien*.—A description of a piece of Hittite sculpture found in 1930.

BRANDENSTEIN, W.—*Die Sprache der Pisider*.—An attempt to decipher the inscriptions in Greek characters on stelae found at Sofoular in 1890 by Ramsay and Hogarth, and a denial of the belief that they contain names only.

Do., IX, 3. 1934.

PUDELKO, G.—*Altpersische Armbänder*.—The history of early Persian art is traced in jewellery from its Chaldean-Hittite beginnings to its stifling by Greek elements.

WEIDNER, E. F.—*Die Feldzüge Šamši-Adads V. gegen Babylonien*.—A large inscribed limestone stela (Ashur 6596), which was found in the German excavations of 1905, has yielded important new material for the history of Assyria and Babylonia. It bears an historical inscription of Shamshi Adad V, the first part of which agrees with the inscription on his stela from Nimrūd, whilst the following part gives a description of the 5th and 6th campaigns against Babylonia. These campaigns may now be dated, the 5th to 814 B.C. and the four earlier ones to 821–815 B.C. The inscription names eleven gods of Dēr, and gives the fullest list known; it furthermore solves the riddle of Vat. 9628, which is now seen also to deal with the 5th campaign, and to complete and amplify the account on the stela.

BOSSERT, H. T.—*Das hethitische Pantheon*.—A continuation of the article in VIII, 6 (*A.E.E.*, 1933, iii, iv, p. 127), on gods figured as on a panther. The Cretan god on seals from Cnossos and Hagia Triada respectively is compared with the Hittite god Dadas, and the following problems are discussed: Does the word *dada* occur in the Hittite script with the meaning of "father"; is the meaning of *uru*, "big," confirmed in further passages; and is the reading obtained for the leg and foot ideogram confirmed in other words?

The shorter contributions include:—

MEISSNER, B.—*Omina zur Kenntnis der Eingeweide des Opfertieres*.—Twenty-two lines of cuneiform text, each giving an external characteristic of the sacrificial sheep from which the condition of its entrails might be deduced.

PREZWORSKI, S.—*Altorientalische Altertümer aus polnischen Sammlungen*.—The first of a series of descriptions of little known antiquities in Polish collections, mostly of unknown provenance.

FRANKFORT, H.—*Einige Bemerkungen zur Sumerer-Frage*.—The age and duration of the Early Dynastic period, the first appearance of the Sumerians, and the El-Obeid period.

Do., IX, 4. 1934.

VAN BUREN, E. D.—*A Clay Relief in the 'Iraq Museum*.—The clue to the interpretation of this relief, which apparently belongs to the Larsa period, is given by the band-symbol on each side of the Mother-goddess. This band-symbol occurs singly on a limited number of objects, most strikingly on the *kudurru* of Melishipak from Susa, where it rests upon a knife lying on an altar, and must represent the goddess Ninḫursag. It is explained as a swaddling band, the symbol of Ninḫursag as goddess of childbirth.

BOSSERT, H. T.—*Nischan-Tepe und Nischan-Tasch*.—The discovery of part of a stone hammer of a known type in a hole in this inscription proved that the inscription was in existence when the fortress was destroyed about 1200 B.C., but the author of the inscription is not identified.

Do., IX, 5–6. 1934.

SENK, H.—*Die Proportionskanon in der ägyptischen Rundbildnerci*.—By taking measurements of three types of Old Kingdom statues (seated, standing and kneeling), the writer settles a vexed question by showing that there was a canon of proportion in Egyptian art, the unit being the head measured from the base of the neck to the growing point of the hair on the forehead. This unit is the only length of the body which is defined in a relatively clear way in those drawings of the human form which are plotted out in a "scaffolding"



(Schäfer's "*Hilfsgerüst*"), or network of squares, whilst in sculpture in the round the head unit is the only length which is uniformly present in all types. The use of this canon means that though statues were in proportion they were not in anatomical proportion.

Do., X, 1-2. 1935.

WEIDNER, E. F.—*Aus den Tagen eines assyrischen Schattenkönigs*.—The German excavations at Ashur brought to light a collection of 112 well preserved cuneiform clay tablets recording twelve consecutive months in the reign of Ninurta-tukul-Ashur, of whom very little had been previously known. This king seems to have reigned from 1154-1153 B.C., so that these tablets cover most of his reign. Fifty-one of them are in the Berlin Museum; the rest are presumably in the Museum of Antiquities at Istanbul. Forty-nine of the Berlin tablets have been published already, but four of these are given in cuneiform here for the first time. Of the other two, one bearing a seal impression only is discussed in a separate section of this article by Dietrich Opitz, and the remaining one is reproduced, transliterated, and translated here. The inscriptions on the sixty-one other tablets are transliterated and translated from photographs taken at the excavations, as the tablets themselves are not available.

Four tablets in this series bear seal impressions, three of which are the same, a king hunting ibex; the fourth is two eagle-headed creatures confronted. One of the tablets is stamped with the hunting scene only, without any inscription, and may, therefore, be considered to be the royal official seal. It is the only royal Assyrian seal known in which the king is depicted in person, and it takes the hunting scene a hundred years further back than it was known hitherto (*i.e.*, on the obelisk of Ashur-nasir-pal I).

Through this find more is known of this king than of many more important ones, for though the inscriptions record the receipt and issue of sheep, oxen, and goats, they incidentally reveal much of interest about the king, his court and harem, the extent of the realm at the time (greater than has been supposed), the gods, religious rites, etc. For instance, the eunuch received an ox as compensation for having been attacked by a lion. (The number of lions kept by the king cannot have been large, as they were allotted a sheep every other day only.) Among the craftsmen is mentioned an "iron" smith, and this is one of the earliest mentions of a worker in iron.

VAN BUREN, E. D.—*Entwined Serpents*.—The twelve illustrations to this article are from seals and seal impressions of which seven are in the 'Iraq Museum. They show the motive in its various forms, ranging from two rearing serpents coiled round each other one or more times to forms in which the convolutions are most intricate. This motive must have been in use over the greater part of the Near East. Entwined serpents are a very ancient illustration of the belief that serpents embodied the male and female principles and that their proximity bestowed a blessing on mankind. The most celebrated of all the representations of the motive is that on the vase of dark green steatite dedicated by Gudea to his god Ningizzida, and its representation here may be thought to be a very strong argument for accepting Frankfort's theory that the motive symbolized this god. But the writer finds it difficult to believe that such an ancient symbol could have been relegated to the position of an image of a minor deity whose importance waxed and waned with the lifetime of Gudea. He knows only one object with this motive belonging to a period after Gudea, namely, a serpentine amulet from Nippur. The motive then disappears and

re-emerges after many centuries transformed into the symbol of the god of healing, Asklepios.

Do., Vol. X, 3. 1935.

BISSING, FREIHERR W. v.—*Geschnitzter Holzsarg persicher Zeit aus Ägypten*.—The coffin which is described and photographed in this article was formerly in the writer's collection in the Carnegielaan Museum at the Hague, but its present whereabouts are uncertain. The low arches which had been cut at the base point to its having been used as a hen coop. L. B. E.

BULL. OF THE METROPOLITAN MUSEUM OF ART, NEW YORK. XXX, 5. 1935.

WINLOCK, H. E.—*Faience Tiles from an Egyptian Palace*.—These tiles from el-Kantir, probably the city Raamses and scene of the Oppression of the Israelites, show the Pharaoh's enemies, bound and suppliant. A few that are more attractive have scenes of a canal with ducks and fish and lotus flowers, and of young girls carrying their pet gazelles. D. M.

EGYPTIAN RELIGION. Vol. III, no. 2. April, 1935.

FOUCART, G.—*Études Thébaines (Série 2). Les Voyages mystiques aux Villes Saintes*.—This is a portion of an article on the funeral scenes and ceremonies depicted in Theban tombs. The conclusion reached is at variance with some of the accepted views: the funerary scenes under discussion are said to be not specifically Theban and not to represent real funerals; to private tombs have been transferred the traditional equipment of fabulous and mythical royalty. It is assumed that the scenes represent funerary plays derived from myths and legends, which were celebrated or commemorated on traditional dates at Buto, Busiris, and Mendes, or on the sites of ancient kingdoms of the Libyan part of the Delta. These various plays are condensed on the walls of Theban chapels in the form of extracts, and make a composite picture there. The boats are there to take the deceased to each of the ancient sanctuaries so that he may take part in all these ceremonies.

GASTER, T.—*An Egyptological Text from Ras Shamra (R.S., 1929, No. 6)*.—This text, hitherto a complete enigma, reveals itself upon close examination to be a congratulatory ode addressed to the Egyptian overlord of Ugarit. That Ugarit (Ras Shamra) was for some time under Egyptian domination is known from (a) the Poem of Pentaur which describes its subjugation by Rameses II in the course of his Syrian campaigns; (b) the markedly Egyptian character of the remains excavated (see *A.E.E.*, June, 1934); and (c) Tell el-Amarna letter B.M. XXX (Bezold), in which the burning of one half of it by the Hittites is represented as a concern of the Egyptian Pharaoh. Excursus I deals with "Egyptianisms in the Text," and the second Excursus discusses Regal Odes in the Psalms. L. B. E.

MAN. May, 1935.

CATON-THOMPSON, G.—*A Revision of Recent Research upon some Stone-Age Problems in North Africa*.—This summary of the Rivers Lecture calls for the proper recording of stone implements, with the local hydrography, wherever they are found by motoring and other parties in the Libyan Desert and Sahara. In the Khargeh Oasis "even in the Middle Paleolithic maximum of moisture" . . . "implements clung to the two areas of artesian mound-springs" and on the

scarp wherever springs and seepage or surface drainage gave a water supply. The various cultures are discussed, including the Upper Acheulian which appears to link with Palestine (Umm el-Qatifa and Tabūn F). D. M.

ORIENTALIA. Vol. IV (Nova Series). Fasc. 2. 1935.

TILL, W.—*Zu den Wiener koptischen Zaubertexten*.—These texts were formerly in the collection of the Archduke Rainer, and were published by Stegemann under that designation. They now form part of the National Library, and Till has studied them anew under better conditions.

WORRELL, W. H.—*Coptic Magical and Medical Texts* (cont.).—Three more texts are given in this article, of which the first is “a paragogic love charm, differing from others in that its purpose is honest love and matrimony.” The second “deals with medicine rather than magic; for the medicamenta, irrational as they appear to us, are the sole means of treatment. There are no prayers or spells.” L. B. E.

ZEITSCHRIFT FÜR ÄGYPTISCHE SPRACHE, LXX. 1934.

SCHÄFER, H.—*Die Simonsche Holzfigur eines Königs der Amarnazeit*.—This little wooden figure of a king of the Amarna period (Berlin 21836) is fully described and illustrated; the jewellery worn, the “blue crown”, and the nature of the Amarna art are discussed in three appendices. The king is shown wearing his own beard. The gold necklace and the bracelets worn by the figure were royal jewellery; they are known in this association on statues of Amenhotep III and Amenhotep IV, and they occur among the votive offerings made to Amen by Thotmes III at Karnak, where they are described as “the jewellery (*prw*) of His Majesty of gold and precious stones” and “the jewellery (*prw*) which has protected the tomb of the god (*i.e.*, king).” This particular set of jewellery was also bestowed on the King’s subjects as an award of valour in the XVIIIth dynasty. The little statue under discussion wears the “blue crown”. Until conclusive evidence is available, Schäfer prefers to continue to use non-committal terms such as “blue crown”, “blue cap”, and “Nefertiti crown” for the three types of headgear.

BORCHARDT, L., KONIGSBERGER, O., and RICKE, H.—*Friesziegel in Grabbauten*.—Formerly, the pottery cones called “funerary cones” were thought to be paving stones, but they are here shown to have been parts of an ornamental frieze. The same technique is known in Mesopotamia, and in both countries the cones are of two kinds, some plain, and some stamped with the owner’s name. The inference is that Egypt was influenced by Mesopotamia. This article was written before the writer had seen *The Egyptian Expedition 1925-27*, Section 2, of the *Bull. Metr. Mus. of Art*, Feb., 1928, pp. 6, 7, figs. 4 and 5.

REISNER, M. B.—*Inscribed Monuments from Gebel Barkal*.—Part 4, *The Stela of Prince Khaliut*.—This stela is No. 52 in the List of Monuments in Part 1, and is marked 52 in red on the plan of the temple. Prince Khaliut is definitely stated in the main inscription to be the son of King Piankhy, yet the tomb is stated to have been built by Aspalta, and it seems nearly impossible that Khaliut could have survived into this reign. A possible explanation is suggested by a statement in line 17 that Aspalta “had built tombs for those that had none”. Khaliut may thus have died long before the reign of Aspalta, who may have enlarged the tomb or reburied him, setting up the stela in commemoration of this pious act.

SCHARFF, A.—*Ein Denkstein des Vezirs Rahotep aus der 19 Dynastie*.—

This stela—no. 287 in the Munich Glyptothek—has been described as belonging to the Horbêt finds (*Zeitschrift*, LXI, p. 63, note 2), but wrongly so, in the writer's opinion, since the Horbêt finds all commemorate humble folk, mostly soldiers. On the upper half of this stela Rameses II is shown censuring his own statue, behind which are shown four ears, and in the lower half kneels the vizier Rahotep, praying to this statue.

SETHE, K.—*Das alte Ritual zur Stiftung von Königstatuen bei der Einweihung eines Tempels*.—This is a correction of the translation of some texts in the temple of Thothmes III at Medinet Habu, published in *Re'-Heiligtum des Rathures*, pp. 100 ff. The texts of two scenes announce the dedication of two statues of Thothmes III which were set up in the temple he had built for Amen; the texts of the other two scenes are an address to the statue in question, and are a counterpart of the final clauses of Speech 540, Pyr. 1332a.

WILKE, C.—*Zur Personifikation von Pyramiden*.—There are some instances in the Old Kingdom and one case in the Late Period of the personification of a pyramid; three modifications of this idea are discussed in detail here.

KEES, H.—*Zu einigen Fachausdrücken der altägyptischen Provinzialverwaltung*.—The administrative terms discussed in this article are: (1) The supposed title "Overseer ( $\text{𓂏}$ ) of the southern door (of Elephantine)", of which there is no instance throughout the Old Kingdom and Middle Kingdom, and (2) the meaning of  $\text{𓂏}$  in Middle Kingdom documents.

PIEPER, M.—*Das Märchen von Wahrheit und Lüge und seine Stellung unter den ägyptischen Märchen*.—Among the Chester Beatty papyri in the British Museum is the *Tale of the Blinding of Truth*. Parallels may be found in two Late Greek stories, confirming the view that Egypt has contributed to the world's storehouse of tales. In this story a happy ending seems indicated, and the writer thinks that the *Tale of the Doomed Prince* also ended happily.

BORCHARDT, L.—*Einige astronomisch festgelegte Punkte zweiter Ordnung im Neuen Reiche*.—The following conclusions are reached: (1) The Feast of Ptah of Memphis in year 34, mentioned in an inscription recently published by Jéquier (*Deux pyramides du Moyen Empire*, 13-15 and fig. 12), refers to the reign of Rameses II and was at the full moon. (2) Accepting the view that the accession of Seti I was the beginning of the "Era ἀπὸ Μενοφρέως", the date of the accession of Rameses II may be taken as 4 September (Calendar of Julius Cæsar), 1301 B.C. (3) The view that there is some truth in the Bentresht inscription derives some support from the fact that the Feast of Amen mentioned in the date on line 6 is shown to have been at the full moon. (4) A choice of dates may be given for the coronation and death of Rameses III and for the coronation of Rameses IV, respectively.

HÜCKEL, R.—*Über Wesen und Eigenart der Pataiken*.—The faience figures of naked dwarfs without attributes are faithful reproductions of the dwarf condition known as *chondrodystrophia foetalis* or *achondroplasia* and have nothing to do with rickets. [Dr. Guest has already shown this in *Pathology and Art at El-Amarna in Ancient Egypt and the East*, 1933, p. 81 ff.]

ZYHLARZ, E.—*Konkordanz ägyptischen und libyschen Verbalstammtypen*.—A recognition of the homogeneity between the Berber speech and a Libyan component of the ancient Egyptian language carries research in Old Egyptian into a new phase of knowledge.

EDGERTON, W. F.—*A-lk=k "Cease"!*—In I Kh. 5, 6, *a-lk=k* is to be taken

as a true imperative, used with a suffix pronoun as direct object, and has no connection with *ⲁⲗⲟⲩ* (see the writer's study of the Egyptian imperative in *Studies presented to F. Ll. Griffith*, 1932, p. 63).

STEGEMANN, V.—*Zur Textgestaltung und zum Textverständnis koptischer Zaubertexte*.—This is a detailed criticism of certain passages in Kropp's *Ausgewählte kopt. Zaubertexte*, I–III.

The Miscellany consists of a short article by Sethe on the correct reading of *ⲭⲓ* priest; it is *ḥrw-ḥb.t*, a *Nisbe adjectiva*.

ZEITSCHRIFT FÜR AEGYPTISCHE SPRACHE, LXXI. Part I. 1935.

The first fourteen pages consist of a bibliography of the writings of Adolf Erman up to 31st October, 1934, compiled by H. Grapow. Books, pamphlets, and reviews are listed under twelve headings, and publications which have appeared independently (books or pamphlets) are marked.














SCHÄFER, H.—*Altägyptische Bilder der auf- und untergehenden Sonne*.—These twenty-one pictures are to be found in the literature of the dead and in tombs of the later New Kingdom. They are explained by the writer as representing the whole course of the sun in the sky in one picture, though sometimes the rising and sometimes the setting is given greater emphasis. As Sethe explained these pictures as representing the rising sun only, the writer had intended to discuss his paper with Sethe before publishing it, but was prevented from doing so by Sethe's death.

BISSING, FREIHERR W. VON.—*Unterteil der Statuette eines Kamose*.—In this figure the end of the long tunic hangs down between the ankles, and this feature together with the name Kamose, which is not known among private persons after the beginning of the XVIIIth dynasty, leads the writer to date the statuette not later than the first part of the reign of Thothmes III, though the mother's name, Rui, and certain peculiarities in the text would suggest a later date.

BISSING, FREIHERR W. VON.—*Ein angeblicher ägyptischer Rollzylinder der Übergangszeit*.—The cylinder seal discussed in this article has been dated by Sir Arthur Evans to the VI–XIth dynasty, but the writer classes it with "Hittite" cylinders of the second millenium, and reproduces the photographs of the two ends which are given in Delaporte's *Catalogue (1910) des cylindres orientaux et des cachets, etc., de la Bibliothèque Nationale*, pl. 34, No. 515 a–c, where a description is also given.

WAINWRIGHT, G. A.—*Amun's Meteorite and Omphaloi*.—To clear up a widespread misunderstanding of the nature of Amun's sacred objects at Thebes, Siwah, and Napata, the writer explains that the idols at Siwah and Napata were not meteorites but *omphaloi*, that is, dome-shaped objects of human manufacture, whilst there is much to suggest that the Theban fetish was a meteorite; probably, indeed, a portion of an iron meteorite. An interesting point arising from this possibility is that "it looks, therefore, as if both Amun and Seth were worshipped under the form, not merely of meteorites in general, whether of iron or stone, but specifically of iron meteorites".

GRAPOW, H.—*Die Himmelsgöttin Nut als Mutterschwein*.—In the "dramatic text" describing the sky in *The Cenotaph of Seti I at Abydos*, pl. 84, 1, 3, Nut is said to eat the stars and is called "the sow that eats her piglets" for so doing; moreover, in 11, 13 and 14 one star is called "the piglet of its mother". There is a representation of this aspect of Nut in a blue glazed sow with sucking pigs (B.M. 11976) inscribed on the base, "Nut, the great one, mother of the god(s)".

GRAPOW, H.—*Zum Gebrauch der alten Pronomina absoluta*.—The writer draws attention to some uses of the old absolute pronoun, , , , supplementing those already well known: (1) , etc., without introductory particle, as subject at the beginning of a sentence in a nominal sentence, e.g., with *sdmf*, as in line 11 of the inscription quoted in the preceding article in *The Cenotaph of Seti I at Abydos*, , , , "he, he said"; , "she, she ate" (I. 3); , , "they, they live" (I. 7); (2) , as subject after the verb in the sense of pseudoparticle, 3rd person, feminine, e.g., , *nfrsy* "she is beautiful", often used for  *nfrty*.

SPIEGEL, J.—*Zum Gebrauch der Apposition im Ägyptischen und Arabischen*.—The use of the apposition in Egyptian shows considerably more variety and complication than in our language, and corresponds exactly in its variety with the use of the apposition in Arabic. It may be classified as follows:—


(1) Apposition proper (complete identity).

(a) Ordinary apposition, e.g., Amon-Ra, King of the gods.

(b) Apposition of numbers and measures (for numbers, see Sethe, *Von Zahlen und Zahlworten*, p. 46).

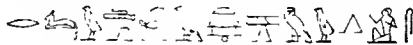
(c) Apposition of materials.

(d) Apposition of parts, e.g., "a funeral offering, bread, beer, etc.," which we should have to amplify by "consisting of bread, beer, etc."

(e) Emphasizing apposition (tautology), e.g., , "twice", used after a sentence.

(2) Partial apposition, or, to borrow a term from Arabic grammar, "Badal apposition.

(a) In the complete form with pronoun, e.g.,



"... to separate myself from the road" (more exactly, "from him who went on it") (*Sinehat*, R. 28-29, where the accepted translation, "to separate the road from him who went on it" makes no sense).

(b) In contracted form without pronoun.

"Badal" apposition occurs also in the extended passive participles and the relative forms, and also in forms with *no . ty*. Everything that can be expressed by apposition can also be stated in the form of a sentence expressing identity. There are, therefore, sentences in Egyptian in which there is only partial identity between subject and predicate, and these are thus similar in nature to "Badal" apposition (e.g., "Thine arm is Atum"). Moreover, as the relationship between words in apposition is the same as that between subject and predicate in sentences expressing identity, all kinds of apposition can be introduced by the *m* of equivalence.

(This essay was accepted as an Inaugural Dissertation by the Philosophical Faculty of the Friedrich-Wilhelms University of Berlin.)

STEGEMANN, V.—"ορζωορε εἰτεγζομ = stark."—In ancient magical texts demons are sometimes characterized as "strong". This epithet occurs in Coptic magical texts as well as in Greek, but in four of these the words ζωορε εἰτεγζομ take the place of ζωορε alone, with which δυνατός of the LXX is generally rendered. This phrase is traced to Ps. 103, 20, where angels are called δυνατοὶ ἰσχύι. These four texts belong to the 7th and 8th centuries, and it is significant of the spiritual change wrought in Egypt under the influence of Christianity to find that such a striking formula has penetrated into them.

MÜLLER, H.—*Die Mumie der Schep. en. esc in St. Gallen*.—This mummy and its two coffins have been at St. Gall for 110 years, but the place of origin is not known. It is tempting to regard the lady as the daughter of the man of her father's name and office, whose mummy is in Berlin, for her name is the same as his mother's and his father's name is the same as that which is presumably her grandfather's.

#### MISCELLANY.

This section is occupied by two short contributions: (1) a suggestion by H. D. SCHAEDEL that the time of day called *nw n sty r*<sup>3</sup> (Erman-Grapow, *Wörterbuch*, IV, 350) really means "time of awakening", "breakfast time" being a secondary meaning; (2) confirmation by W. TILL of a suggestion made by him in *Zeitschrift*, LXIII, p. 98, for the reading of a phrase in 2 Macc. vi, 4, as *εἰρ.μῦταξεῖ μῦτῖα.με*. He now considers that *μῦταξεῖ* stands for *μῦτ-ατ-με* from *με* "useful", so that *εἰρ.μῦταξεῖ* means literally "live as a good-for-nothing". L. B. E.

Other publications received:—

W. F. BADÈ, *A Manual of Excavation in the Near East*. 1935. (Univ. of California Press and Cambridge Univ. Press.) 7s.

*Bull. of the Metropolitan Museum of Art, New York*, Section II: The Egyptian Expedition 1934-1935.

*The Private Life of the Ancient Egyptians, A Picture Book*. Metropolitan Museum of Art, New York. (Bernard Quaritch, Ltd.). 25 cents.

*Bull. of the American Institute for Persian Art and Archaeology*, Vol. IV, No. 1, June, 1935.

*Bull. of the American School of Prehistoric Research*, No. 11. May, 1935.

*Bull. of the Metropolitan Museum of Art, New York*, XXX, No. 9, September, 1935.

*Bull. of the Museum of Fine Arts, Boston*, XXXIII, No. 199, October, 1935.

*Iraq*, Vol. II, part 2. October, 1935.

*Journal of the American Oriental Society*, Vol. 55, Nos. 2, 3. June, September, 1935.

*Man*, Vol. XXXV. June-December, 1935.

*Palestine Exploration Fund Quarterly Statement*. July, October, 1935.

*The Oriental Institute of the University of Chicago*, 1935. (Fourth Edition of the Handbook.) 35 cents.

*The Quarterly of the Department of Antiquities in Palestine*, Vol. IV, No. 4.

## NOTES AND NEWS.

THE fieldwork, and the associated publications, of the British School of Archaeology in Egypt will be proceeded with as usual this season, despite the discontinuance of *ANCIENT EGYPT AND THE EAST*. Two sites will be under excavation: Sheikh Zowaiyid (the ancient Anthedon), on the Egyptian side of the Palestine-Egyptian frontier, and Tell Ajjul, near Gaza. At the former, Sir Flinders and Lady Petrie began work in November, assisted by Mr. Ellis and Mr. Pape, and a group of new students, Miss V. Seton-Williams, Dr. and Mrs. Teasdale, and Mr. Waechter. The excavation of the Palestinian site, Tell Ajjul, will be resumed in January, it is hoped, by Dr. Margaret Murray, assisted by Dr. Edith Guest and members of the staff from Sheikh Zowaiyid.

\* \* \* \* \*

Among the many excellent results of last season's excavations it would seem invidious to mention some and not others. But the importance of Mr. M. E. Mallowan's work at Tell Chagar Bazar on an ancient caravan route, 30 miles S.W. of Nisibin, is outstanding in that it supplies a clear sequence of pottery and other objects from prior to 4000 B.C. down to c. 1400 B.C. The mound was found to contain fifteen settlements superimposed, and it was excavated down to virgin soil some sixteen metres below plain level. This may prove to be a key site in the study of the many types of painted pottery that in prehistoric times extended right across Asia as far as China and the Indus valley.

\* \* \* \* \*

We have to record the appointment of Mr. P. L. O. Guy to succeed Mr. J. W. Crowfoot as Director of the British School of Archaeology in Jerusalem on the latter's retirement. Mr. Guy is also undertaking a survey of a dolmen field in Transjordan with the grant associated with a Fellowship of the British School of Archaeology in Iraq.

\* \* \* \* \*

The success of Professor Baxter and his colleagues of the St. Andrews University expedition in clearing several remarkable mosaics in the ancient Palace of Byzantium has raised the question of the establishment of a British Institute of Archaeology at Istanbul. It is reported that the Turkish authorities regard the project with a favourable eye.

\* \* \* \* \*

The appointment of Dr. L. W. G. Malcolm, whose work at the Wellcome Historical Medical Museum is well known, as Organiser of Museums to the L.C.C. is an experiment which will be watched with interest. This is a newly created post which promises to fill a great want in co-ordinating the work of the museums and the schools.

\* \* \* \* \*

In the article on Coptic Painted Pottery in the last number of *ANCIENT EGYPT AND THE EAST*, it was stated that "museum authorities refuse to accept it [*i.e.*, Coptic pottery] or relegate it to store-rooms." The British Museum must be exempted from this accusation; it has always led the way in the study of this otherwise neglected subject, and has given Coptic pottery its full value in its galleries.

\* \* \* \* \*

Inquiry is being made by the Egypt Exploration Society for photographs of the temple at Armant that are known to have been taken by F. Frith in 1857, and by MM. du Camp and Félix Teynard. The Robert Mond Expedition to



Armant hopes to make a reconstruction of the temple built by Cleopatra and of the scenes on its walls, and the loan of these or other photographs, and any information from old books and diaries, would be welcomed at headquarters (200 Euston Road, London, N.W.1.).

\* \* \* \*

The Second International Congress of Prehistoric and Protohistoric Sciences will be held at Oslo in August, 1936. Particulars may be obtained from the Bureau of the Congress, Universitetets Oldsaksamling, Oslo.

## OBITUARY.

### JAMES HENRY BREASTED.

1865-1935.

Dr. J. H. Breasted will be remembered not only as a distinguished archaeologist but as an organiser of remarkable ability. To his genius for organisation combined with the generous financial support of Mr. J. D. Rockefeller, jun., is due the Oriental Institute of Chicago, whose widespread activities in the Near and Middle East and well equipped research at home are helping towards a much needed co-ordination in the study of the ancient civilisations.

It was with Egyptian archaeology that Dr. Breasted's name was first associated, but from early days he had visions of man's history as a single whole, of which Egyptology formed but one facet. His book for students, *Ancient Times, a History of the Early World*, was a first result of that view: the Oriental Institute followed naturally.

An indefatigable traveller, Dr. Breasted took the earliest opportunity after the war to make a preliminary survey of those regions of the Near East that it made accessible for archaeological study. In 1920 he arrived in Jerusalem from Mesopotamia and Syria, full of delightfully infectious enthusiasm and particularly pleased with the ancient wall-paintings at Salahiyah on the Euphrates which had been discovered by chance during the war.

Despite his apparently tireless activity in the direction of archaeological research in so many countries and along many diverse lines of inquiry, Dr. Breasted yet found time for works of deep erudition as well as books of more popular appeal.

### C. H. CORBETT.

The British School of Archaeology in Egypt has lost one of its most devoted helpers by the death of Mr. C. H. Corbett, who for many years has been its Honorary Treasurer. Mr. Corbett spared himself no trouble in promoting the welfare of the School and was untiring in his work. He was not an archaeologist but a barrister, and as such his work for the School was known only to those who worked with him, but to them he will remain an example of self-devotion and unwearied zeal.

M. A. M.

### SENATOR PAOLO ORSI.

1859-1935.

THE illustrious Italian archaeologist, Paolo Orsi, made himself a reputation far beyond the boundaries of his country by his unremitting labours, chiefly in Sicily and Calabria. By his exploration of the Neolithic villages of Stentinello

and of many cemeteries, he brought to light four periods of Siculan culture, from the Chalcolithic age of the second millenium B.C. down to the time when the culture of Greece submerged that of Sicily in the fifth century B.C. At Locri he excavated the only known Ionic temple in Magna Graecia and discovered the famous *pinakes*.

### JAMES EDWARD QUIBELL.

The passing of Edward Quibell leaves a blank in the lives of many, for a man more beloved by a wider circle of friends would be difficult to find. Quibell began his career as an Egyptologist in 1893, when he went with Petrie to Koptos. At this time the history of Egypt did not go back beyond the IVth dynasty; nothing was known of any connection with foreign countries, and Herodotus was regarded with contempt as the Father, not of History, but of Lies. The Koptos excavations showed that history extended perhaps to a Ist dynasty, a startling theory. The year following saw the excavations at Naqada and Ballas, where the finds were so extraordinary that no one could date them, for to suggest a prehistoric period in Egypt was practically blasphemy. When some years later de Morgan proved the predynastic date of the Naqada finds the whole of that civilisation fell into its proper sequence. But Quibell's chief claim to fame as an excavator was his work at Hierakonpolis. His epoch-making discovery of the slate-palette and mace-head of Narmer and the mace-heads of still earlier kings brought him to the forefront of Egyptologists and gave him a European reputation. After some years spent in excavation he entered the Government service, and when an Englishman was required to hold a position in the Cairo Museum the choice fell on him.

Throughout his life whatever difficulties might beset his path, Quibell went his serene way and won through by means of his transparent honesty, his sincere kindness, his unfailing tact and his personal charm. When he retired from the Museum, and from the work and the country that he loved, there came the darkest period of his life; for before he had been a few months in England he lost his wife. Later, some happiness came to him; on Firth's death the Department asked him to continue the work on the Step-pyramid. His finds there were very remarkable, and he was looking forward to some years of work on the site when death overtook him. He has left a gap in the little band of Egyptologists which can never be filled.

M. A. M.

### SIR TEMISTOCLE ZAMMIT.

Professor Zammit's training was that of a biologist; and for many years he was associated with the band of scientists engaged in discovering the cause of Malta fever. His investigations among the goats took him to practically every farm in the island, and his kindness and geniality secured him a welcome wherever he went, so that his equal interest in the "big old stones" was well known among the country people. Therefore it was not surprising that a farmer at Tarxien—a village on the cliff to the west of Grand Harbour—came to him one day and said, "My fields are full of big stones. Please come and look at them and clear them away." Then began the excavation of the most wonderful and complete megalithic temples in the Mediterranean area. Zammit's publication in *Archaeologia* of his finds drew the attention of more than the archaeological world to Malta, even in the last years of the war. His careful observation

and records established a sequence of dates within the island itself, though hitherto no satisfactory connection with other countries has been found for his Neolithic period. As Director of the Valletta Museum and Director of the Archaeological Department, appointments which he held till his death, he was in touch with all discoveries in Malta and Gozo, and he was as keen at the end as he was at the beginning. He had, however, two grievances with which, I venture to think, most people will sympathise. The first was a small one: he complained that when tourist ships called at Malta the passengers were taken willy-nilly to the San Antonio Gardens, whereas they should have had the choice of visiting the Tarxien temples and Hypogeum. More serious was his indignation at stopping the investigation of Malta fever as soon as the host was discovered from which the parasite is communicated to man; so that even now there seems no certainty as to how the goats are infected. As Government would do nothing he used to buy a few goats yearly and make his experiments quietly; he made a few discoveries, but it is an investigation which requires team-work and a large sum of money before the islands can be cleared of this scourge.

Alike in archaeology and biology the death of Temistocle Zammit leaves the world poorer

M. A. M.







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